Zhang, Xiao

From: Zhang, Xiao
Sent: Wednesday, July 27, 2016 11:26 AM
To: 'Benjamin.Gibson@lw.com'; Kelly.Richardson@LW.com
Subject: RE: ECI's work plan and EPA's 2005 Action Memo
Attachments: ECI YUMA CNTY LF PROFILE.PDF; SE601069 ECI.PDF; Figure 1 Stockpile sampling J...pdf; SE601071 ECI.pdf

Ben, yes they did. I've attached the waste profile report, the analytical reports, and the sampling locations.

Thanks,
Xiao

From: Benjamin.Gibson@lw.com [mailto:Benjamin.Gibson@lw.com]
Sent: Tuesday, July 26, 2016 8:52 PM
To: Zhang, Xiao <Zhang.Xiao@epa.gov>; Kelly.Richardson@LW.com
Subject: RE: ECI's work plan and EPA's 2005 Action Memo

Thanks, Xiao. Did ECI submit a separate waste profile report as well?

From: Zhang, Xiao [mailto:Zhang.Xiao@epa.gov]
Sent: Tuesday, July 26, 2016 3:15 PM
To: Richardson, Kelly (SD); Gibson, Benjamin (SD)
Subject: ECI's work plan and EPA's 2005 Action Memo

Hi Kelly and Ben,

As we discussed, attached are the current version of ECI's work plan and EPA's 2005 Action Memo.

Thank you for your time and please let me know if you have any questions.

Xiao

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

MEMORANDUM

SUBJECT: **REQUEST FOR TIME CRITICAL REMOVAL ACTION**
For Soil Piles and Excavations at 20846 Normandie Avenue
Historical Stormwater Pathway – South (OU 6)
Montrose Chemical Superfund Site, Los Angeles County, CA
Site ID Number: 0926

FROM: Susan Keydel, Remedial Project Manager, Site Cleanup Section 1, SFD-7-1 SK

THROUGH: Roberta Blank, Chief, Site Cleanup Section 1 R Blank

TO: Elizabeth Adams, Chief, Site Cleanup Branch, Superfund Division

DATE: November 2, 2005

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of the proposed time-critical removal action described herein. Under the Removal Action requested by this Memorandum, excavated soil held in soil piles at 20846 Normandie Avenue, in Los Angeles County, California (near Torrance California) will be transported off-site to an appropriate permitted hazardous waste landfill. The 20846 Normandie Avenue property is owned by Mr. Ronald Flury and occupied by Ecology Control Industries, Inc. (ECI); this property is referred to hereafter as the "ECI Property." The excavated soils, estimated to include up to 3000 tons of soil, contain elevated concentrations of several hazardous substances including dichloro-diphenyl-trichloroethane (DDT) and other pesticides, total petroleum hydrocarbons (TPH), and polychlorinated biphenyls (PCBs). EPA believes that the DDT and other hazardous substances were transported to this location by way of the historical stormwater drainage pathway that conveyed contaminants from the Montrose Chemical Corporation of California (Montrose) former DDT manufacturing plant, which was located at 20201 Normandie Avenue, in Los Angeles County, California. The proposed action will address the potential threat to public health and the potential release or threat of release of contaminated soil from the numerous large soil piles (source area), as described in greater detail in this Action Memorandum.

II. SITE CONDITIONS AND BACKGROUND

Category of Removal:	**Time Critical**
Site Name:	Montrose Chemical Superfund Site
Site Status:	NPL
CERCLIS ID:	CAD008242711

A. Background

From 1947 until 1982, Montrose manufactured the insecticide dichlorodiphenyltrichloroethane (DDT) at a manufacturing plant located at 20201 Normandie Avenue in Los Angeles County, California (referred to hereafter as the former Montrose Plant Property). Production at the former Montrose Plant Property ranged from approximately 1 million to 8 million pounds per month of technical grade DDT as the manufacturing process changed throughout the 35 years of plant operation. In 1962, production reached 5.5 to 6.0 million pounds per month of DDT. [1,2]

One of Montrose's parent corporations, Stauffer Chemical Corporation (Stauffer) was the owner of the former Montrose Plant Property. Stauffer leased the northern portion of the former Montrose Plant Property to Montrose beginning in 1947. On the southeastern portion of the former Montrose Plant Property, Stauffer operated a research facility and benzene hexachloride (BHC, or hexachlorocyclohexane) pilot plant where the pesticide Lindane (the *gamma* isomer of BHC) was produced from the early 1950s until 1963. Lindane production created a waste stream of alpha-, beta- and limited delta-BHC. In 1964, Stauffer dismantled the BHC plant and leased that portion of the former Montrose Plant Property to Montrose, which expanded its operations into this area. EPA's investigation of the Stauffer BHC operations is ongoing.

The use of DDT in the United States was banned in 1972 (except for use pursuant to special permits). Between the years 1972 and 1982, Montrose continued production of DDT at the former Montrose Plant Property for overseas markets. The DDT plant at the former Montrose Plant Property was closed in the summer of 1982, and during the remainder of 1982 and 1983, the plant was dismantled. The majority of the concrete footings were crushed, debris was buried in trenches on-property, and crushed concrete was used as a sub-base for grading and paving the former Montrose Plant Property with asphalt. The EPA did not approve the re-grading and paving as a response action.

Today, the former Montrose Plant Property and adjacent areas (i.e., the Jones Ditch, Los Angeles Department of Power and Water (LADWP) and Normandie Avenue Ditch) remain contaminated with DDT and other hazardous substances. Since approximately 1984, the former Montrose Plant Property has been kept asphalted and fenced. Response actions have also been implemented at portions of the Jones Ditch, LADWP Right-of-Way and Normandie Avenue Ditch to protect public health and prevent further release of DDT to the environment.

DDT and other substances related to the activities at the former Montrose Plant Property have entered the environment and are being addressed by EPA. Currently, EPA is investigating, and where necessary, identifying and taking (or has taken) response actions for contamination related to the following aspects of the Montrose Chemical Superfund Site:

- Soils on and near the former Montrose Plant Property, focusing on commercial/industrial properties (Operable Unit 1, OU 1).
- Dense non-aqueous phase liquids (DNAPLs), primarily made up of DDT and chlorobenzene (one of the raw materials used in DDT manufacturing), in soil under the former Montrose Plant Property, extending down to depths of greater than 90 feet, into the upper groundwater units (OU 3).
- Dissolved groundwater contamination, which extends vertically through up to six hydrostratigraphic units and laterally (downgradient) over 1.3 miles from the former Montrose Plant Property (OU 3).
- Montrose-related contamination in the sanitary sewers, as a result of discharges to the sewer system during operations at the former Montrose Plant Property (Removal Action).
- Residential soils contaminated by aerial dispersion of DDT from the former Montrose Plant Property, and by fill materials deposited to those areas (OU 4).
- Montrose-related contamination in segments of the *historical* stormwater drainage pathway, addressed in this Action Memorandum and prior action memorandums, see below (OU 4 and OU 6).
- Montrose-related contamination in the *current* stormwater drainage pathway, including the Kenwood Drain, the Torrance Lateral, the Dominguez Channel and the Consolidated Slip (OU 2).
- Montrose-related contamination on the ocean floor off the coast of Palos Verdes, California ("Palos Verdes Shelf") discharged from the sanitary sewer outfall (OU 5).

B. Historical Stormwater Drainage Pathway

The historical stormwater drainage pathway that originated at the former Montrose Plant Property initially entered a drainage ditch on the west side of Normandie Avenue, crossed Normandie Avenue and continued south to and beyond Torrance Boulevard, subsequently passing through what is now the eastern portion of the ECI Property. The ditch then continued easterly through and beyond the adjacent Royal Blvd Disposal Site.

EPA's 1998 *Final Remedial Investigation Report for the Montrose Superfund Site* [1] shows the components of the historical stormwater pathway as continuous from the former Montrose Plant Property to, and beyond, the ECI Property. Stormwater leaving the former Montrose Plant Property would collect just beyond the southeastern boundary of the former Montrose Plant Property, an area referred to as the Normandie Avenue Ditch Ponding Area. From there, stormwater was conveyed across Normandie Avenue via an 18-inch culvert, and entered an "unimproved channel" that passed by houses along 204th Street [3], and continued south via a ditch along the west side of Kenwood Avenue (a.k.a. the Kenwood Ditch), to Torrance Boulevard (Figure 1). Stormwater then crossed under Torrance Boulevard and entered the area now occupied by the ECI Property. Generally, beginning south of Torrance Boulevard, this historical stormwater drainage pathway broadened into a slough, or swale.

Historical topographic maps and aerial photographs from as early as 1916 show a continuous pathway of drainages and sloughs along Kenwood Avenue, and south of Torrance Boulevard, through the area currently identified as the ECI and Royal Boulevard Disposal Site properties, and beyond. An analysis of historical aerial photographs was conducted to identify the extent of that historical stormwater pathway within the ECI Property and the adjacent Royal Boulevard Disposal Site, by identifying ditches, ponding areas, and potential riparian and wetland vegetation. Figure 2 shows EPA's understanding of the extent of the historical stormwater pathway within and near the ECI Property, based on the analysis of historical aerial photographs. [4]

During heavy rains, significant volumes of stormwater from the former Montrose Plant Property would enter the stormwater pathway as sheet flow, transporting DDT on the ground from grinding, formulations and transport and storage operations. Montrose estimated that during a 1-inch rainfall, a minimum of 224,000 gallons would leave the southeast corner of the former Montrose Plant Property and enter the drainage ditch. [5]

Additionally, Montrose wastewater periodically entered the surface water drainages when the industrial process wastewater system would back up. Between 1947 and approximately 1953, the former Montrose Plant Property had a series of concrete or brick in-ground pipelines that conveyed wastes to an unlined surface impoundment (a.k.a. the wastewater pond). Acidic wastewater along with other miscellaneous drainage from the plant (such as stormwater runoff from the Central Process Area and process cooling water) flowed to the wastewater pond. Prior to discharge of these industrial wastewaters to the sanitary sewer system, the pH of the wastewater pond was adjusted by passing wastewater through a "lime bed" consisting of sugar lime. The neutralized wastewater was then discharged from the pond through a 10-inch diameter pressurized line that tied into the Los Angeles public sewer system, west of the former Montrose Plant Property near Western Avenue.

According to City of Los Angeles Department of Public Works reports, this early industrial wastewater system periodically backed up, causing wastewater to overflow onto the former Montrose Plant Property and enter the surface water drainage pathway. A February 24, 1953 memorandum from the City of Los Angeles Department of Public Works [1] documents that Montrose acidic wastes had ponded at both the southeast fence boundary of the former Montrose Plant Property and at the corner of 204th Street and Kenwood Avenue (previously referred to as Florence and Maple Streets), a portion of the historic stormwater pathway.

In the late 1960's and early 1970's, the Los Angeles County Flood Control District installed a buried concrete stormwater drainage system referred to as Project 685, Kenwood Avenue - Supplemental. The new system, Project 685, replaced both the ditch along Kenwood Avenue and the slough that was present in what is now the ECI Property and beyond. The Los Angeles County Flood Control District continues to have an easement for Project 685 that passes through the properties north of Torrance Boulevard. South of Torrance Boulevard, easements also exist along the eastern side of the ECI Property and through the Royal Avenue Disposal Site property, and beyond, through the area of the historical ditch and slough.

Installation of the buried stormdrain for Project 685 required excavation of existing soil in order to place the large, concrete box drain. Construction drawings for the segment of Project 685 in what is now the eastern portion of the ECI Property show a ground elevation of approximately 16 to 17 feet mean sea level (msl) prior to construction [6], believed to be the low point of the historical stormwater drainage flow path. The Project 685 box-drain (8 ft wide and 12.5 feet high) is shown on the as-built drawings as having the invert (interior bottom of the drain) at approximately 11 feet msl, and the top is shown as having one foot of fill above the box drain for a finished surface elevation of 26.5 ft msl within the ECI Property.

In 1998, the owner of the ECI Property had construction drawings prepared for re-grading the northern portion of the ECI Property [7]. Those drawings show the soil elevation exceeded 40 feet msl at the western edge of the northern parcel, and was 35 to 36 feet msl along the eastern edge of the ECI Property, with a low of 31 feet msl in the northeast corner along the drainage easement. The ECI Property was re-graded, pushing soil from west to east to generally level the property. Soil from the embankment along Torrance Boulevard and a large mound of soil on the northeastern portion of the ECI Property (created from grading the southern parcel of the ECI Property) were used for the re-grading [8]. Post-grading, the surface elevation of the ECI Property transitions smoothly from approximately 40 ft msl at the western edge of the ECI Property to approximately 36 ft msl along the eastern edge of the ECI Property above the LA County drainage easement. Residential properties immediately east of the ECI Property are shown as having elevations between approximately 33 and 36 ft msl.

Figure 3 shows a conceptual model of EPA's understanding of the history of the ditch elevation relative to the placement of the Project 685 box drain and the current ground elevation adjacent to and above the LA County drainage easement on the ECI Property.

This Action Memorandum requests approval for a removal action addressing soil that has been excavated from the historical stormwater pathway portion of the ECI Property. This excavated soil contains Montrose-related contaminants as well as other hazardous substances. This removal action will also address the 5 open excavations at the ECI Property that are located near the soil piles.

C. Site Description

1. Physical Location

The 20846 Normandie Avenue property is a commercially zoned property owned by Mr. Ronald J. Flury, and occupied by Ecology Control Industries (ECI). The ECI Property is located near the intersection of Torrance Boulevard and Normandie Avenue, in Los Angeles County, California

(Figure 1), approximately 1 mile south of the intersection of the San Diego Freeway (I-405) with Interstate 110. The area is densely developed with a mixture of commercial/industrial and residential land use. Immediately adjacent to the ECI Property are several small commercial businesses (northwest), a commercial business development (south), and six (6) residential properties (single-family and multiple-family residential units) adjoining the ECI Property to the east with additional homes along Raymond Avenue. Additional residential areas are located to the north across Torrance Boulevard (4-lane road), and to the west across both Normandie Avenue (a 4-lane street) and a wide grassy median.

The ECI Property is within the City of Los Angeles area known as the Harbor Gateway Community that serves as a link between the main area of the City of Los Angeles and the City's Port and the communities of San Pedro, Wilmington and Harbor City. In the vicinity of the ECI Property, there are recent and ongoing development activities, as well as long-term business enterprises.

2. Site Characteristics

The ECI Property is currently occupied by ECI, a California-registered hazardous waste transporter that "*utilizes the Property as a dispatch yard for its truck fleet and for maintaining roll-off bins, containers, and other environmental use equipment and vehicles. The* [ECI Property] *operates as a 24-hour a day secured facility and is surrounded by a concrete block wall and chain-link fencing. One office building is located on the* [ECI Property]. *Minor maintenance of containers may be performed at the* [ECI Property], *such as repairing or painting roll-off bins. ECI operates as a hazardous waste transporter under EPA Identification # CAD982030173 and the* [ECI Property] *operates as a hazardous waste generator under EPA Identification # CAL000278605.*" [7]

A Preliminary Assessment [8] was completed by EPA in January 1993 for Akzo Coatings Inc., the previous owner of the Property. Mr. Flury purchased the southern portion of the Property, nearly 5 acres, from Akzo Coatings, Inc. in 1992. The eastern portion of this parcel was not paved at that time. Several years later, Mr. Flury purchased the 2.7 acres immediately north (the northern parcel) from Akzo Coatings, Inc. This northern parcel had reportedly been used only for parking, and contained a "large pile of soil which was generated during surface grading" of the southern parcel.

While owned by Akzo Coatings Inc., two tank farms were reportedly located on the Property along the southern boundary. The tanks were used to store petroleum-based solvents. At the time those tanks were removed, a release of toluene from one of the tanks was discovered. This release required soil and groundwater investigations, and the installation of a soil vapor extraction (SVE) system. Akzo operated the SVE system for several years while the Property was owned by Mr. Flury. According to Mr. Flury [9], part of the ECI Property transfer agreement was to concrete or asphalt the ECI Property to facilitate SVE system operations. Prior to the installation of the SVE system, Mr. Flury leveled and concreted the western portion of the parcel; ECI occupied the ECI Property while the SVE system was running. On July 22, 1996, the California Regional Water Quality Control Board (RWQCB) issued a closure letter confirming the completion of the investigation and remedial action for the underground storage tank(s) formerly located at the Property.

Mr. Flury continues to own and ECI still occupies these parcels.

3. Removal Site Evaluation

In May and June 2005, EPA learned that a Phase I Environmental Site Assessment and Phase II sampling had been done at the ECI Property to prepare for property transfer for proposed residential development. However, elevated DDT concentrations had been detected in soil during these sampling activities. [10] As later reported by Haley and Aldrich [7], Phase II activities were conducted to "*confirm previous investigation findings, to perform a gap analysis based on ECI activities conducted at the Site since their operations commenced in the mid-1990s, and to investigate findings identified during the Phase I.*" Soil and soil-gas samples were collected at 15 locations across the 7.3-acre Property on February 7 and 8, 2005; additional soil sampling was conducted on March 23, 2005, generally using a 150 by 150 foot grid. Samples were analyzed for pesticides and PCBs. On April 12 and 13, 2005, 24 additional soil borings were advanced and sampled to further delineate pesticides and PCBs along the eastern portion of the ECI Property. Between February 7 and June 9, 2005, over 200 soil samples were collected at the ECI Property, with sampled depths ranging from just below ground surface (bgs) to approximately 15 feet bgs. This activity was performed without regulatory oversight.

During a June 13, 2005 conference call with Mr. Flury and Mr. Peter Goldenring, counsel to Mr. Flury [11], EPA asked the owner to stop excavation activities and securely cover piles of soil at the ECI Property. On June 14, 2005, EPA issued a Request for Information letter to Mr. Flury [12] under Section 104(e) of CERCLA. Three information submittals [7, 13, and 14] were received in partial response to EPA's 104(e) letter. Additionally, EPA has had numerous conference calls and meetings with Mr. Flury and his representatives. From these communications, EPA learned more about the known extent of DDT and other contaminants in soil at the ECI Property, and about additional activities that have occurred since sampling began. EPA's current understanding is summarized below.

Analytical results of soil samples collected as part of the Phase I and II studies conducted for the ECI Property in the spring of 2005 identified elevated concentrations of several chemicals. Contaminants having concentrations exceeding Federal and/or State regulatory limits include:

- DDT - detected at a maximum reported concentration of 325 ppm DDT (sum of 4,4'-DDT, 4,4'-DDE, and 4,4'-DDD). Samples containing elevated DDT concentrations were collected from the eastern area of the ECI Property. Approximately 35 samples had soil DDT concentrations above 10 ppm (the upper end of the regional background range as determined by EPA [15]).

- Chlordane - detected at a maximum reported concentration of 3.5 ppm from soil collected along the easternmost portion of the Property.
- PCBs - detected at a maximum concentration of 23.1 ppm (sum of Aroclors 1254 and 1260).

In addition, total petroleum hydrocarbons (TPH) were detected at concentrations up to 28,900 ppm (sum of oil and diesel fractions); and benzene hexachloride (BHC), a hazardous substance related to past operations at the former Montrose Plant Property, was also found in soil samples (maximum concentration of 0.019 ppm as beta-BHC).

To address soils with elevated chemical concentrations, "*ECI performed excavations and stockpile activities and Haley & Aldrich provided oversight of the excavation and conducted confirmation soil sampling activities.*" Excavations were conducted between March and June 2005 (March 17, 2005; May 17, 18, 26, and 27, 2005; and June 2, 3, 8, and 9, 2005). [7] These activities were performed prior to EPA's involvement.

Initially, excavated soil was reportedly stored in roll-off containers next to the open excavations they came from. However, as roll-off containers were needed for other uses, soil was transferred to piles. Soil from excavation SB-03 (see Figure 4), where PCBs had been detected, was allegedly kept separate from other soil, while the remainder of excavated soil was co-mingled into the piles currently on the Property [16]. However, during a visit to the ECI Property on October 26, 2005, contractors for EPA were informed that soil from the ECI Property excavations is not currently held in bins. [17]

In June of 2005, ECI transported a total of 512 tons of excavated soil to American Remedial Technologies (ART) located in Lynwood, CA (159 tons on June 3, 2005 and 353 tons on June 10, 2005). These activities were performed prior to EPA's involvement; EPA was not aware of and did not approve of this action. Based on copies of the waste manifests provided to EPA, the soil was characterized as "non-hazardous waste solid (soil contaminated with hydrocarbons)." [7] Soil taken to ART was reportedly taken from the large soil pile adjacent to excavations associated with soil borings SB-05, SB-20 and SB-35. Specifically, soil was reportedly taken from the north end of the pile along the back (eastern) side, immediately south of the storm grate and adjacent to excavation SB-05. [16] Based on the concentration of hazardous substances in soil prior to excavation, EPA determined that the excavated soil is hazardous waste (see below). However, the ART facility in Lynwood CA is not permitted by the State or EPA to receive CERCLA or RCRA waste. The California Department of Toxic Substances Control (DTSC) has been notified of soil disposed of at ART.

The estimated volume of soil present in the soil piles was twice estimated by the Property owner and provided in writing to EPA. Initially, the volume was reported to be 200 to 250 cubic yards [18]. Later, the Property owner informed EPA that the 250 cubic yard estimate was incorrect, so EPA requested a correct volume estimate. A subsequent estimate was given at approximately 190 loads (presuming 20 to 25 tons per load) [19]. However, in subsequent communications, the owner verbally revised the estimated soil volume to be only 100 loads (2000 to 2500 tons, assuming 20 to 25 tons per truck load). Confirmatory estimations were conducted on behalf of

EPA. The volume of soil that remains on the Property was determined to be approximately 100 to 120 loads, or 2000 to 3000 tons, in soil piles covered by plastic sheeting and secured with sand bags. [17]

4. Release or threatened release into the environment

The table below summarizes chemicals detected in samples collected from soil prior to excavation. Soil at and surrounding the sample locations was subsequently excavated by the ECI Property owner. With the exception of soils from the SB-03 excavation, soils were reportedly excavated and mixed with other excavated soils. [16]

A statistical evaluation [21] of sampling data from the ECI property [7] was conducted for EPA. An evaluation of spatial distribution of contaminants in soil boring samples showed:

- Soils sampled and excavated within the area of the historical stormwater pathway are statistically different in total DDT concentrations from those soils from the remainder of the ECI Property (e.g., areas outside of the extent of the historical stormwater pathway had a mean concentration of less than 1 ppm total DDT while the excavations areas, all within the historical stormwater pathway, had mean concentrations ranging to 18.7 ppm total DDT).

- The presence of elevated concentrations of chlordane did not co-occur with elevated DDT findings (i.e., the presence of chlordane-related compounds inversely correlates with the presence of elevated DDT).

- A correlation was seen between the occurrence of beta-BHC and elevated total-DDT (total-DDT greater than 10 ppm, the upper range of the regional background values). However that correlation was only moderately strong. Correlations were not evident with other BHC isomers or when total DDT was at background concentrations.

Further, data characterizing two of the excavation areas (SB-05 and SB-20) had 95 percentile upper confidences on the mean (95% UCL) values exceeding 10 ppm.

Six "hazardous substances" (DDT, DDE, DDD, chlordane, dieldrin and PCBs), shown in bold type on Table 1, are "hazardous substances" as defined by Section 101(14) and Section 101(33) of CERCLA, 42 U.S. C. Section 9601(14), and 40 C.F.R. Section 302.4 and Table 302.4.

- DDT and chlordane, present in soil that was subsequently excavated, was reported at concentrations exceeding the listed total threshold limit concentrations (TTLCs) specified in 22 CCR Section 66261.24 for disposal of organic persistent and bioaccumulative toxic substances. The excavated soil has been classified by EPA as hazardous waste pursuant to the State of California characteristic for toxicity, and therefore while in the State of California (including while at the ECI property), soil in the piles must be managed as hazardous waste.

- Substantial evidence supports the continuity of the historical stormwater pathway from the former Montrose Plant Property to and through the ECI Property, with hazardous substances (e.g., total DDT and isomers of BHC) released by Montrose and/or Stauffer Chemical from the former Montrose Plant Property into this pathway [17]. EPA has concluded that DDT and BHC released from the former Montrose Plant Property came to be located on the ECI Property via flows of surface water runoff and process wastewater from the former Montrose Plant Property into the historical stormwater pathway. Therefore, the excavated soils must also be managed under the CERCLA Off-Site rule, 42 U.S.C. Section 9621(d)(3).

Table 1
Summary of Hazardous Substances Detected in pre-Excavated Soil at ECI

Hazardous substance	CASRN	UTS	Maximum Detected Conc.
alpha-BHC	319-84-6	0.066 ppm	0.0011 ppm
beta-BHC	319-85-7	0.066 ppm	0.019 ppm
delta-BHC	319-86-8	-	0.0041 ppm
gamma-BHC	58-89-9	0.066 ppm	0.0062 ppm
Chlordane (a)	**57-74-9**	**0.26 ppm**	**3.5 ppm**
DDD	**72-54-8**	**0.087 ppm**	**19 ppm**
DDE	**72-55-9**	**0.087 ppm**	**8.7 ppm**
DDT	**50-29-3**	**0.087 ppm**	**310 ppm**
Dieldrin.	**60-57-1**	**0.13 ppm**	**0.18 ppm**
PCBs	**1336-36-3**	**10 ppm**	**23.1 ppm**

"CASRN" - Chemical Abstracts Service Registry Numbers for each hazardous substance.
"UTS" – Universal Treatment Standard; the constituent-specific treatment standards found in §268.48
(a) Chlordane includes alpha & gamma isomers, and technical mixture and metabolites.

In a letter to the owner of the ECI property on July 25, 2005 [22], EPA stated that the DDT and BHC in the historical stormwater drainage pathway north of Torrance Boulevard are related to the Montrose Chemical Superfund Site, and thus are federally listed hazardous wastes pursuant to RCRA, with a classification of DDT as U061 and BHC as U129. This statement was made prior to EPA receiving and reviewing additional information for the ECI Property conditions and history.

Information available at this time is inconclusive regarding whether the DDT and BHC released from the former Montrose Plant Property and now found in the excavated soils at the ECI Property originated from RCRA listed sources at the former Montrose Plant Property. As described above, subsequently provided data characterizing the ECI Property and the soil piles was reviewed and the correlation of DDT and BHC was found to not be strong enough to be conclusive. Statistical evaluations of submitted data show only a moderate correlation between beta-BHC and elevated total-DDT. EPA has not completed its evaluation of the historical stormwater pathway south of Torrance Boulevard. However, consistent with EPA guidance on management of CERCLA wastes [23], EPA is assuming that the soil piles do not contain a listed RCRA hazardous waste, and therefore, are not federally regulated hazardous waste under RCRA. Based on the above, the soil piles are still subject to California RCRA requirements for management at the ECI Property and disposal of the excavated soil within California.

The soil piles contain elevated concentrations of hazardous substances, and so EPA is determining that they must be disposed of in a Subtitle C hazardous waste landfill. However, the proposed removal action will not require treatment prior to land disposal under federal RCRA requirements. These determinations are limited solely to the soils which are the subject of this Action Memorandum.

The presence of soil piles containing hazardous substances at the ECI Property presents both an imminent and substantial endangerment to public health (as defined in CERCLA, 42 U.S.C. Section 104(a)(1)), and an actual or threatened release of hazardous substances into the environment (as defined by Section 101(22) of CERCLA, 42 U.S.C. Section 9601(22)). Elevated levels of hazardous substances present in these soils, stored above ground, could potentially migrate with prevailing winds (from the west) to the residential properties immediately east of the ECI Property, if not properly managed.

Further, the imminence of the rainy season for the Los Angeles area presents an additional threat of release. Precipitation and subsequent sheet flow across the ECI Property may cause soil containing hazardous substances to migrate off-Property or be released from the ECI Property to the storm grate on-Property, which drains into the Project 685 stormwater drainage system. Stormwater in the Project 685 drain (a.k.a. Kenwood Drain) is discharged to the Torrance Lateral, an open stormwater drainage, which enters the Dominguez Channel, and ultimately flows to the Consolidated Slip, a part of the Los Angeles/Long Beach Harbor. Excavated soil at the ECI Property contains total-DDT at concentrations exceeding 100 times the concentration known to exist in the current stormwater drainage pathway. Potential releases from the ECI Property to the current stormwater drainage pathway could result in significant ecological risk from exposure to those contaminated soils.

5. NPL Status

The Montrose Chemical Superfund Site was placed on the NPL in 1989.

6. Maps, Pictures and other Graphic Representations

(See attached.)

D. Other Actions to Date

1. Previous Actions

Beginning in 1999 and continuing through 2002, EPA conducted investigations of soils and homegrown produce in residential areas surrounding the former Montrose Plant Property, and conducted a removal action at 23 residential properties along the segment of the historical stormwater pathway north of Torrance Boulevard. [24]

As part of this work, in 1999 during Phase I of the investigation, EPA collected background surface soil samples, from areas in several directions from the former Montrose Plant Property, including cross-wind and up-wind directions. EPA determined that the regional background concentrations of total DDT in surface soil (up to 2 to 4 miles from the former Montrose Plant Property) averaged between 1 and 3 ppm, and ranged up to about 10 ppm.

On June 8, 2001, EPA signed an Action Memorandum [2] for removal of soil from yards on the west side of Kenwood Avenue, between 204th Street and Torrance Boulevard; this effort is referred to as the Kenwood Storm Water Drainage Pathway Removal Action. The goals of this action were to remove soil in residential properties which contained Montrose-related contamination from the historical stormwater pathway, and thereby reduce any present or future significant health risk to residents related to DDT exposure, above the levels already present from soils in the South Los Angeles area.

During excavation for remediation at homes along the west side of Kenwood Avenue, a layer (and layer fragments) of depositional material containing high levels of DDT was clearly visible in subsurface soil at three properties. This depositional layer is believed to have been the bottom of the former stormwater ditch along the historical stormwater pathway. The southernmost residential property where depositional layer was discovered on Kenwood Avenue was only three lots north of the ECI Property across Torrance Boulevard. On November 2, 2001, EPA issued an Amendment to the Action Memorandum [3] to address the identification and removal of the depositional layer (e.g., protocols to adjust the excavation approach and depths), including under structures. This resulted in deeper excavations at several properties.

The presence of this layer along the historical stormwater pathway is consistent with the conclusion that process wastewater and stormwater from the former Montrose Plant Property entered and traveled down the historic stormwater pathway along Kenwood Avenue. The Administrative Records for the Kenwood Removal Action contain documents considered by EPA in reaching that conclusion. A detailed discussion addressing material excavated from the yards and the depositional layer can be found in the removal action Completion Report. [15]

2. Current Actions

No actions to address the soil piles have yet been undertaken at the ECI Property, beyond the excavation and disposal work conducted by the ECI Property owner, and control actions required of the ECI Property owner by EPA to mitigate potential wind erosion, by covering of the soil piles with plastic sheeting secured by sand bags.

The actions presented for approval in this Action Memorandum (see Section V, below) are consistent with response actions selected by EPA for other aspects of the Montrose Chemical Superfund Site.

EPA prepared and distributed a fact sheet (on September 8, 2005) to the surrounding area property owners and residents, identifying the soil piles and potential subsequent sampling work at the ECI Property and possibly at adjacent residential properties. EPA has had one-on-one communications with several of the owner/occupants of the adjacent residences and businesses. The fact sheet was provided in both English and Spanish; and the door-to-door communications were conducted by a team fluent in both of these languages. EPA will continue to perform community outreach for this removal action. Information will be provided on a regular basis to keep the community informed of progress regarding this and other components of the Montrose Chemical Superfund Site.

3. Public Involvement

Within 60 days of the initiation of on-Property removal activities described in this Action Memorandum, EPA will publish a notice of availability of the associated Administrative Record, and provide a public comment period of at least 30 days.

E. State and Local Authorities Role

1. State and Local Actions to Date

DTSC is working with EPA as a support-agency on the Montrose Chemical Superfund Site. EPA has communicated with DTSC regarding the need for action related to the excavations and soil piles at the ECI Property. The State agencies have not taken separate response actions related to the current soil piles on the ECI Property.

2. Potential for Continued State/Local Responses

It is anticipated that the state agencies will remain in a support role to EPA, with EPA as the lead agency for the Superfund response actions at the ECI Property. On behalf of the State of California, DTSC has identified their preferences for the handling of the soil piles. Those preferences (see below) have been incorporated by EPA in this proposed removal action.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

A. Threats to Public Health or Welfare

Soil in the piles stored at the ECI Property contain hazardous substances which could pose an actual or potential human health risk. Residential properties are immediately adjacent to the ECI Property and particularly the portions of the ECI Property where excavations occurred and soil piles are stored. The eastern side walls of several of the excavations are less than 10 feet from the boundary with residential properties. Releases to residential properties could result in threats to public health.

The excavated soil piles at the ECI Property contain hazardous substances (based on results from *in situ* soil samples) including DDT, chlordane and PCBs. The EPA Region 9 Preliminary Remediation Goals (PRGs) corresponding to a one-in-a million cancer risk over a lifetime (30 year) exposure period are provided for comparative purposes.

- DDT – The maximum total-DDT value of 325 ppm was detected in soil excavated from the SB-05 area. Numerous samples from the ECI Property contained DDT results exceeding 10 ppm, particularly in soils excavated from nearest to the adjacent residential properties in the area of SB-05, SB-09 and SB-20. The PRG is 1.7 ppm for residential exposure and 7 ppm for industrial exposure. The DTSC Soil Screening numbers for DDT are 1.6 ppm under a residential scenario and 6.3 ppm for an industrial scenario. These values fall within the average background DDT concentration range for soil within the greater Los Angeles area. During the Kenwood Removal Action, EPA used a value corresponding to one- in-one-hundred-thousand (1×10^{-5}) cancer risk for a residential exposure scenario (17 ppm) to determine the need for remediation at residences.

- Chlordane – The maximum total-chlordane value of 4.45 ppm was detected in soil excavated from SB-32. The PRG is 1.6 ppm for residential exposure and 6.5 ppm for industrial exposure. The DTSC Soil Screening numbers for chlordane are 0.43 ppm under a residential scenario and 1.7 ppm for an industrial scenario. Chlordane was detected at or above 0.43 ppm in two samples from the excavated area around SB-32.

- PCBs (Aroclors 1254 and 1260) – The maximum total-PCBs value of 23.1 ppm was detected in soil excavated from SB-35 The PRG is 0.22 ppm for residential exposure and 0.74 ppm for industrial exposure. The DTSC Soil Screening numbers for PCBs are 0.089 ppm under a residential scenario and 0.3 ppm for an industrial scenario. PCBs were detected at or above these levels in five samples collected from the excavated soil areas around SB-35, SB-20, and SB-3.

Soils from these piles, while covered with plastic sheeting, could potentially migrate due to wind or water erosion. The pending rainy season for southern California (>85% of precipitation falls in the period from November through March) and the resultant sheet flow across the ECI Property could cause soils to migrate off-Property and/or into the current Project 685 Stormwater Drainage system (OU 2).

The most significant pathway for human exposure to DDT in soils is by ingestion. Ingestion can occur when a person brings hand to mouth after contact with soils or dust contaminated with DDT, or when a person breathes dust containing DDT, and dust in the throat is swallowed.

This removal action is proposed to abate, prevent, minimize, stabilize, mitigate or eliminate the imminent and substantial endangerment to public health resulting from the actual or potential release of hazardous substances into the environment presented by the soil piles at the ECI Property.

B. Threats to the Environment

The soil piles could potentially erode under the forces of wind or rain. If not removed, contaminated soil could flow into the on-Property stormwater grate which is directly connected to the Project 685 box drain. The Project 685 system discharges to the Torrance Lateral, which feeds into the Dominguez Channel and ultimately discharges to the Consolidated Slip in the Los Angeles/Long Beach Harbor, potentially impacting ecological receptors.

In 1998, the State of California identified the Consolidated Slip as a toxic hotspot based on the findings of an ecological risk assessment conducted under the Bay Protection and Toxic Hot Spots Program. As part of the Montrose Chemical Superfund Site Remedial Investigation activities, EPA is conducting an Ecological Risk Assessment for Montrose-related contaminants in the current Stormwater Pathway (OU 2), including the Project 685 segment (a.k.a. Kenwood Drain).

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of hazardous substances found in the excavated soils at the ECI Property, if not addressed by implementing the response action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

Under this Action Memorandum, the following removal action will be performed.

A. Proposed Actions

1. Proposed Action Description

Under this removal action, the soil piles will be hauled from the ECI Property, and disposed of in accordance with the requirements of this Action Memorandum, as well as with all appropriate and relevant or applicable State and Federal legal requirements (see Section V.A.4, below). In addition, the open excavations are to be lined (to distinguish the area of clean fill from surroundings), backfilled with clean fill, and covered with asphalt or concrete. This proposed action provides the most timely and effective response for removing the source of actual or potential releases, thereby eliminating the threat of release and potential for endangerment to public health and the environment. The components of this removal action are described below.

a. Soil hauling

Soil hauling will be performed to remove all currently excavated soil from the ECI Property. This volume is estimated to be as much as 120 loads (3000 tons).

No additional soil may be excavated at the ECI Property or in the vicinity of the historical stormwater pathway without prior EPA approval.

Excavated soil will be loaded, covered and transported by truck in accordance with all applicable statutes and regulations, including SCAQMD Rule 403, and DTSC and Department of Transportation (DOT) requirements for hauling hazardous waste to a permitted hazardous waste facility. EPA has determined that to avoid a future threat to public health and the environment presented by the hazardous substances present in the soil, the soil must be disposed of at a facility permitted and federally approved for long term management of hazardous waste (Subtitle C facility). Furthermore, the hazardous waste facility where the soils are disposed of must meet the requirements of and be in compliance with the CERCLA Off-Site Policy, 42 U.S.C. Section 9621(d)(3) and implementing regulations, 40 C.F.R. Section 300.440.

b. Excavation Backfilling

Open excavations at the ECI Property will be backfilled in accordance with the following provisions:

- Backfill material brought to the Property will be pre-tested at a minimum for pesticides, volatile organics (VOCs), semi volatile organics (SVOCs), metals, polycyclic aromatic hydrocarbons (PAHs), and BTEX (benzene, toluene, ethylbenzene, and xylene) compounds. Imported soil will be obtained from an area which, based on knowledge of its history, is not located in a known industrial or agricultural area. Backfill material will meet EPA Region 9 Soil Preliminary Remediation Goals (PRGs) for residential exposure, with respect to all contaminants tested, except for arsenic, which will meet a standard of 10 ppm (the value found by the Del Amo Superfund Site Human Health Risk Assessment to be the maximum background value for arsenic in local soils). Sampling results for the backfill material will be presented to EPA for review and approval prior to importing such soil for use.

- Excavations will be lined with a durable liner or geotextile to segregate ECI Property soil from clean backfill. (This is necessary as EPA is separately preparing for additional investigation of *in situ* soil at the ECI Property, as part of additional investigation activities for the Historical Stormwater Pathway-South, for the Montrose Chemical Superfund Site.)

- Backfilling will be conducted in accordance with local, State and Federal requirements and any requirements to be provided by the Los Angeles County Public Works Department for compaction and loading above the Project 685 box drain, which has been exposed by the on-Property excavations.

- Backfilled excavations will be covered with asphalt or concrete to prevent contaminant migration to the clean backfill area.

c. Air Monitoring during Soil Loading and Excavation Backfilling

Wind erosion controls will be in place and properly utilized during all phases of this removal action. Potential for generation of particulate matter by activities related to this removal action (e.g., migration from the work area, including soil piles, excavations and other sources of fugitive dust) will be minimized in accordance with the following provisions:

- To prevent emission of fugitive dust, SCAQMD Rule 403 for Fugitive Dust will be implemented, including maintaining daily records of activities and using best available control measures (Table 1 of the Rule). In accordance with Rule 403, site controls and practices will be implemented to limit the potential for and amounts of dust generation. These include covering exposed soil areas when not in active use, covering soil stockpiles, reducing vehicle speeds, and utilizing water sprays as necessary (e.g., in roads, work areas, etc.). Additionally, use of wind screens around the work area, at the down wind property boundary will be used to prevent release of fugitive dust to adjacent properties.

- In accordance with Rule 403 subparagraph (d)(3), PM_{10} levels will be monitored at the upwind and downwind edges of key activities, no farther than the property boundary. Particulate monitoring will involve daily real-time monitoring performed using a MIE dataRAM Model pDR-1000, or equivalent. The dataRAM uses a passive sampling technique and light scattering photometer to determine particulate concentrations. For each day of monitoring and at regular intervals during each day, the particulate data from downwind monitors will be compared with the data from the background (upwind) monitor and compared to EPA-specified action levels.

- In the event that air monitoring action levels are exceeded or if readings indicate a significant increase in upwind/downwind readings, or visible dust related to site operations is observed, dust control measures will be implemented. Such measures may include water spray, modification of work procedures, and/or suspension of work. If such measures do not result in reductions to below the action levels, Rule 403 contingency control measures (Table 3) will be implemented (despite non-qualification of this work as a "large operation"), including stopping work pending further evaluation of work practices and additional control measures.

- A dust control supervisor will be identified prior to the commencement of work, and will be responsible for implementing sufficient dust control and mitigation measures to ensure daily compliance with Rule 403 and additional requirements, as specified in this removal action Memorandum.

d. Surface Water Runoff and Releases to the Stormdrain

To prevent releases of soil and hazardous substances from entering the current Project 685 stormwater drainage, or being transported off-Property via surface water run-off, the following measures will be implemented to prevent any releases to the storm drain or from the Property:

- Berming at the storm grate and down-gradient Property boundary with absorbent/adsorbent booms;
- Use of filtration devices (e.g., hay bails) to filter suspended sediments from stormwater; or
- Collection of surface water to prevent releases from the ECI Property, followed by sampling to determine appropriate disposal.

Additionally, barriers (e.g., rubber storm drain mats) will be used during soil handling in dry weather to prevent releases of hazardous substances into the on-Property storm grate.

Preventative and stabilization measures will be put into place in the first week of implementation of this Removal Action.

e. Restoration of Damage to other Properties

Following completion of soil removal and excavation backfilling, any damage to adjacent properties will be repaired. Damaged property will be restored, reinstalled, or replaced in-kind if reinstallation is not possible. Items to be restored under this Action Memorandum may include, but are not limited to features along the Property boundary with the residences, including: fencing, decorative walls, retaining walls, plantings, etc. Restorations will be conducted at a minimum to a level equal to the quality of the damaged items, and performed in accordance with current local building codes and requirements in effect at the time of the removal action.

f. Other

Soil hauling will be performed to remove all excavated soil present at the ECI Property as of the date of this Action Memorandum. No additional soil may be excavated at the ECI Property or in the vicinity of the historical stormwater pathway without prior EPA approval.

2. Contribution to Remedial Performance

EPA is conducting remedial work (e.g., investigation, treatability study, design) for various operable units of the Montrose Chemical Superfund Site, including the Historical Stormwater Pathway-South (OU 6) and the Current Stormwater Pathway (OU 2), separately from the scope of this removal action. The need for long-term remedial actions for the Historical Stormwater Pathway-South, if any, will be identified based on information including the results of further investigation.

3. Description of Alternative Technologies

Alternatives to the actions proposed in this Action Memorandum were considered by EPA, and included: (a) using engineering controls to secure the soil piles from wind and/or rain erosion for the duration of the winter, and (b) re-placement of excavated soil into the open excavations.

EPA concluded that soil piles could not be adequately secured for the duration of the winter, to effectively prevent a release of soil or hazardous substances from the soil piles. Precipitation in the Los Angeles area averages 11 inches between November and March. Further, sheet flow from the bulk of the ECI Property (over 7 acres) would be substantial, and the soil piles are currently situated adjacent to the only stormwater drainage grate on the ECI Property. The soil piles would have to be protected from any stormwater runoff (e.g., by diverting runoff around the piles). Further, this alternative does not provide adequate prevention of potential release of stormwater to the adjacent properties (i.e., residential yards and the Royal Blvd Site). This alternative was rejected because it does not provide an effective or permanent response, nor does it afford adequate protection against threat of release, or protection of human health and the environment.

Re-placement of excavated soil into the open excavations was also considered, but rejected as an alternative action.

- This alternative is not protective of human health and the environment as a long term solution.

- Re-placement would likely be an interim solution, as soil beneath the refilled excavations could not be readily sampled during characterization of the Historical Stormwater Pathway-South, without again excavating the soil.

- Re-placement of the soil would activate additional regulatory requirements. PCBs present in the excavated soil are present from a source exceeding 50 ppm (reportedly a transformer knocked to the ground when a pole at the ECI Property was hit by a truck). In accordance with TSCA regulations (40 C.F.R. 761.61), placement of the soil into the excavations for a period of 180 days or more would constitute a permanent remedy, requiring at a minimum: additional characterization/verification of the extent of PCBs in surrounding soil; fencing and posting the ECI Property for PCB contamination; capping above the re-placed soil; and, placing a deed restriction on the Property.

- Replacing the soils could be inconsistent with future remedial actions, if any, that may be selected for this Property.

Finally, DTSC has indicated they do not support backfilling the soil piles into the open excavations, in part because DDT and chlordane concentrations present in the soil exceed criteria for State RCRA characteristic waste (by toxicity).

4. Applicable or Relevant and Appropriate Requirements

The following legal requirements are determined by this Action Memorandum to be Applicable or Relevant and Appropriate Requirements (ARARs) for the selected Removal Actions described in this Action Memorandum. (See 42 U.S.C Section 9621(d)(2) and 40 C.F.R. Section 300.415(j) attainment of ARARs in removal actions.) Only substantive portions of the requirements in the cited provisions below are ARARs for this action.

The excavated soil must be managed as a characteristic hazardous waste within the state of California (including at the ECI Property). Excavated soil containing 1 ppm of DDT or more qualifies as a characteristic hazardous waste under California law, 22 CCR Section 66261.24. If the soil is disposed of in the State of California, all treatment requirements under state law must be met prior to land disposal.

As discussed earlier in this Memorandum, there is sufficient information (contained in the Administrative Record for this removal action) to conclude that hazardous substances released from the former Montrose Plant Property have come to be located on the ECI Property. Consequently, the requirements of the CERCLA Offsite Rule, 42 U.S.C. Section 9621(d)(3) and implementing regulations, extend to and limit the off-property disposal of the soil piles to an Offsite Rule approved facility. Additionally, EPA is making the determination that the excavated soils must be disposed of in a Subtitle C hazardous waste landfill.

Applicable or Relevant and Appropriate Requirements

a. South Coast Air Quality Management District Requirements Applicable to the Excavation and Handling of Contaminated Soil

- SCAQMD Rule 401 -visible emissions
- SCAQMD Rule 402- nuisance dust
- SCAQMD Rule 403 -fugitive dust

b. Hazardous Waste Management - Applicable Pre-Transport Requirements ("CCR" -California Code of Regulations)

- 22 CCR Part 261 - identification of hazardous waste
- 22 CCR 66262.11 -hazardous waste determination by generator

c. Hazardous Waste Management - Applicable Transportation Requirements

- 22 CCR 66262.20-.23 HW Manifests
- 22 CCR 66262.30 HW transporter - packaging
- 22 CCR 66262.31 HW transporter - labeling
- 22 CCR 66262.32 HW transporter - marking
- 22 CCR 66262.33 HW transporter - placards
- 22 CCR 66263.16 HW transporter -container requirements
- 22 CCR 66263.23 (a)(c)(d) HW transporter – operation requirements
- 22 CCR 66263.30-.31 HW transporter - requirements re: release during transportation.

d. Applicable Hazardous Waste Storage Facility Requirements

- 22 CCR 66264.14 - Security Requirements
- 22 CCR 66264.15 (a), (b)(1-4), (c), and (d) - General Inspection
- 22 CCR 66264.50-56 – Contingency Plan and Emergency Procedures

Other Legal Requirements of Independent Applicability

The removal actions selected in this Action Memorandum may trigger additional legal requirements. These requirements are not identified as ARARs because such requirements do not meet the definitional prerequisites for ARARs as set out in CERCLA Section 121, 42 U.S.C. Section 9621(d)(2), or because such requirements are triggered by offsite activities. However, the requirements set out below may apply to portions of the selected removal action as the result of independent application of legal authorities other than Section 121(d)(2) of CERCLA.

- Provisions of Title 22 of the California Code of Regulations relating to offsite shipments of hazardous waste, including but not limited to treatment and disposal requirements and land disposal restrictions.

- Federal and State Occupations Health and Safety Requirements.

- CERCLA Section 103, 42 U.S.C. Section 9603 notification requirements and comparable provisions of California law.

5. Project Schedule

Implementation of this work is anticipated to begin one week following issuance of the Action Memorandum. Prompt implementation of this Removal Action is anticipated because the Property owner/occupant, to be named in the Order, operates a hazardous waste hauling business. However, other factors affecting the schedule may include limitations of the receiving facility, delays due to weather, and other factors. For example, significant removal of the soil piles, currently surrounding the excavations, will be necessary before the excavations can be accessed for lining and backfilling.

Table 2 - Removal Action Schedule Components

Task	**Estimated Implementation Schedule**
Secure Source	
Surface water runoff preventative and stabilization measures	Week 1
Wind erosion measures	Week 1
Soil Hauling	
Soil transport and disposal arrangements	Weeks 1 - 2
Hauling of soil piles (dependent upon availability of trucks and intake capacity of receiving facility – 7 weeks are estimated based on 30 loads per week.)	Weeks 3 to 10
Contingency period for hauling	Weeks 11 to 14
Backfilling of Excavations	
Identification and sampling of a source of clean backfill	Weeks 1 - 4
EPA review and approval of clean fill documentation	Weeks 5 to 6
Lining of the excavations	by Week 8
Fill importing, placement and compaction (dependent upon accessibility of excavations)	Weeks 8 to 14
Contingency period for filling	Weeks 15 to 17
Paving over filled excavations	By Week 18

Following issuance and implementation of the Action Memorandum, a period of approximately 4 months is projected for the completion of the field component of this removal action. Anticipated scheduling components are presented below, in Table 2.

B. Estimated Costs

The total estimated cost of this action is $1,614,000. The basis for these estimates follow.

1. Waste Volume and Mass

This cost estimate presumes a total excavated soil volume of 120 loads, or up to 3000 tons.

2. Costs

Table 3 presents an estimate of costs to EPA for conducting this removal action. Costs may be different (e.g., lower) if work is conducted by other parties.

Table 3 - Removal Action Cost Estimate

Task	Estimated Cost
Site securing	
Surface water runoff preventative and stabilization measures	$8000
Wind erosion measures	$4500
Sampling and Analysis for disposal characterization	$550,000
Air Monitoring	
Daily monitoring and PM_{10} evaluation	$250,000
Soil Hauling and Disposal – Estimates based on 120 loads to US Ecology, Beatty NV (20 to 25 tons per load at $100 per ton)	$300,000
Backfilling of Excavations	
Identification/sampling of fill source	$15,000
Lining of excavations	$10,000
Fill importing, placement, compaction	$200,000
Paving of filled excavations	$7,500
SUB TOTAL	$1,345,000
20% Contingency	$270,000
TOTAL estimated for Removal Project	**$1,614,000**

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Delayed action, or no action, will increase the threat to public health and the environment. With ongoing wind and rain erosion on the covered soil piles, hazardous substances in soil would likely migrate from the soil piles and ECI Property, to both the nearby residential properties (increasing the potential for human exposure), and to the current stormwater drainage pathway (Kenwood Drain) presenting a threat to the environment.

VII. OUTSTANDING POLICY ISSUES

None identified at this time.

VIII. ENFORCEMENT

Enforcement issues are discussed in a separate memorandum, prepared by John Lyons, Assistant Regional Counsel.

IX. RECOMMENDATION

This decision document represents the selected removal action for the ECI Property soil piles and excavations, located at 20846 Normandie Avenue, Torrance California. It was developed in accordance with CERCLA as amended, and is not inconsistent with the NCP. This decision document is based on the administrative record for the removal action.

As documented in this Action Memorandum, conditions at the ECI Property, specifically the soil piles and open excavations, meet the NCP criteria for a removal action (40 C.F.R. Section 300.415(b)(2)). Approval of the proposed removal action is recommended.

The project ceiling for this removal action is estimated to be $1,614,000, and it is expected that the removal action would be completed within six months of initiating the response action.

APPROVED:

Elizabeth J Adams
Signature

November 2, 2005
Date

Elizabeth Adams, Chief
Site Cleanup Branch
Superfund Division

References (available in Administrative Record for Removal Action)

1. *Final Remedial Investigation Report for the Montrose Superfund Site*, Los Angeles California, May 18, 1998.

2. Action Memorandum for Kenwood Removal Action, June 2001.

3. Amended AR for Kenwood Removal Action, November 2001.

4. CH2M Hill technical Memorandum, October 2005. (for HSWP aerials)

5. Inter-office Correspondence to John L. Kallok from B. I. Bratter, Montrose Chemical Corporation of California, January 13, 1983.

6. LA County Public Works As-built construction diagrams for Project 685. Los Angeles County Flood Control District Project No. 685 Kenwood Avenue (Supplemental) Drawing Numbers 428-D4.44 to 428-D4.52 and 428-RW3.1

7. *Response to June 14 and 24, 2005 EPA 104E Letters Requesting Additional Site Investigation Information for Ecology Control Industries Property, 20846 Normandie Avenue, Torrance California*, by Haley & Aldrich, Inc. for Ecology Control Industries, July 2005.

8. *Preliminary Assessment Report, Akzo Coatings, Inc.*, (EPA ID No. CAD085941789), January 12, 1993.

9. July 29, 2005 Memorandum to Site file, from Susan Keydel/EPA, regarding the visit to 20846 Normandie Avenue, on July 19, 2005.

10. Notes from conference calls between Susan Keydel/EPA and Haley and Aldrich, May 9 2005 and June 6, 2005

11. Notes from conference call between Ron Flury/ECI, Peter Goldenring of Goldenring & Prosser, and John Lyons/ORC and Susan Keydel/RPM of EPA, June 13 2005.

12. Request for Information Letter to Mr. Ronald Flury, and his counsel, Mr. Peter Goldenring (June 13, 2005)

13. Letter to Mr. John Lyons, EPA Region 9, from Peter Goldenring, Goldenring & Prosser, June 21, 2005, with attachments.

14. Letter from Peter Goldenring to John Lyons, July 14, 2005 – incomplete 104(e) response

15. Completion Report, Removal Action, Kenwood Storm Water Drainage Pathway, Montrose Chemical Superfund Site, Los Angeles, California. Prepared by Project Resources Inc. (5 volumes). July 2002.

16. Notes from communication between Rick Brown, ECI and Susan Keydel/EPA on October 17, 2005.

17. Memorandum to Montrose Site File, from Susan Keydel, "Association of DDT found at 20846 Normandie Avenue with former Montrose Plant Property," September 12, 2005.

18. Letter from Peter Goldenring to John Lyons, July 18, 2005.

19. Letter from Peter Goldenring to John Lyons, August 30, 2005.

20. Email Communication from J. Dolegowski/CH2M Hill to S Keydel/EPA, October 27, 2005, with attachments.

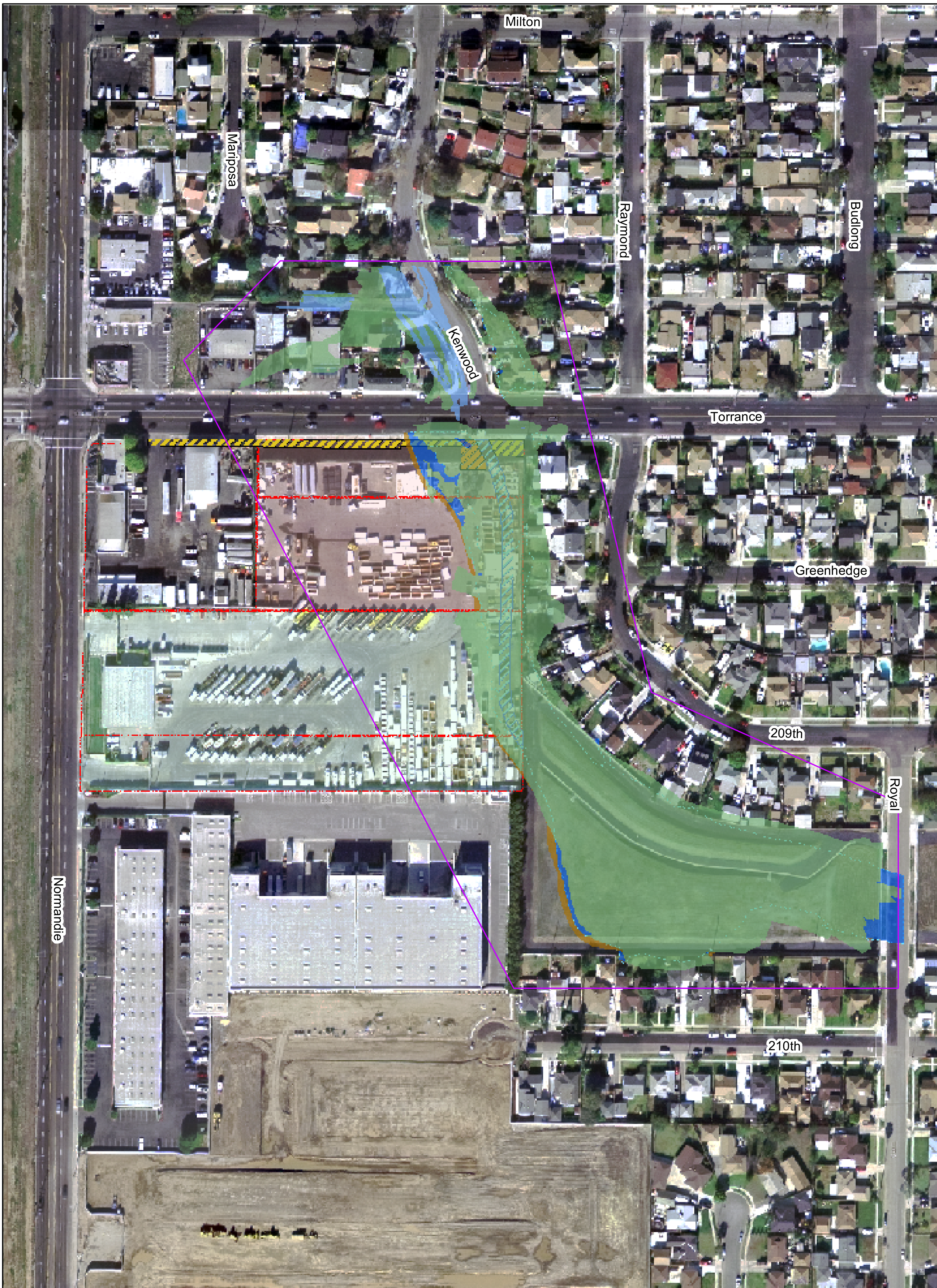
21. Tech Memorandum from CH2M Hill on summary statistics for DDT in ECI data set, October 12, 2005.

22. Letter form S Keydel to R Flury on July 24, 2005.

23. *Management of Remediation Waste under RCRA*, EPA 530-F-98-026, October 1998.

24. *CERCLA Removal Action Memorandum for the Kenwood Storm Water Drainage Pathway,* dated June 8, 2001

Figure 1: ECI Property Location



Legend

- Extent of 1941 Ponded Water
- Area of Focused Analysis

Assessor Map

- Drainage Easement
- LACFCD Easement
- Slope Easement
- Parcels
- Lot 1 of 20846 Normandie Ave
- Lot 2 of 20846 Normandie Ave

Digitized Features

- Potential Wetland/Riparian
- Dirt Road
- Ditch/Potential Wetland
- Ponded Water

Base Image:
USGS High Resolution Orthoimage
Los Angeles March 29, 2004
0.3-Meter Pixel Resolution

N

125 62.5 0 125 Feet

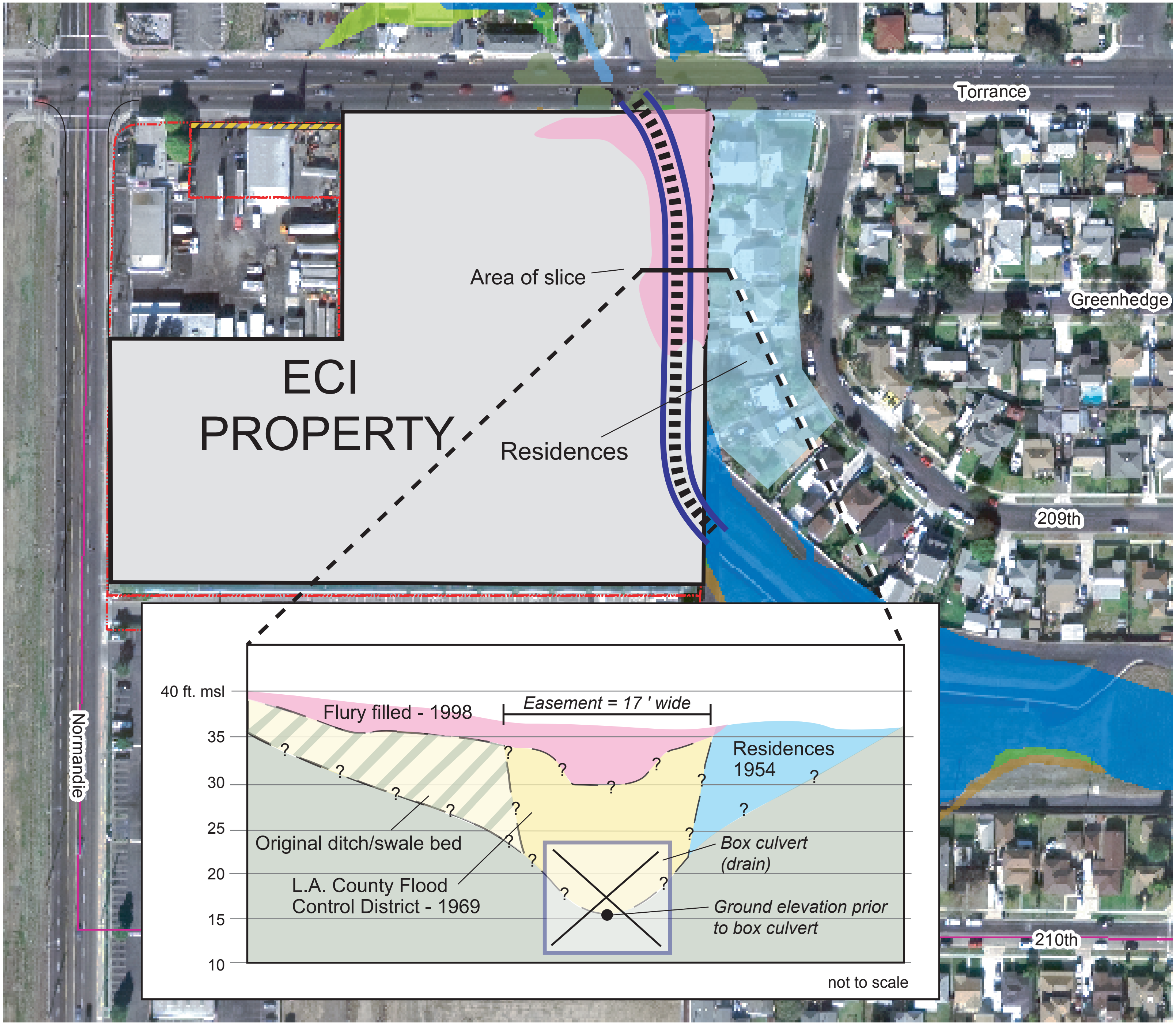
1 inch equals 150 feet

Figure 2: Extent of Historical Stormwater Pathway in ECI Property Area

Features Digitized From 1928 to 1965 Aerial Photographs

HISTORICAL STORMWATER PATHWAY
MONTROSE CHEMICAL SUPERFUND SITE
LOS ANGELES COUNTY, CALIFORNIA

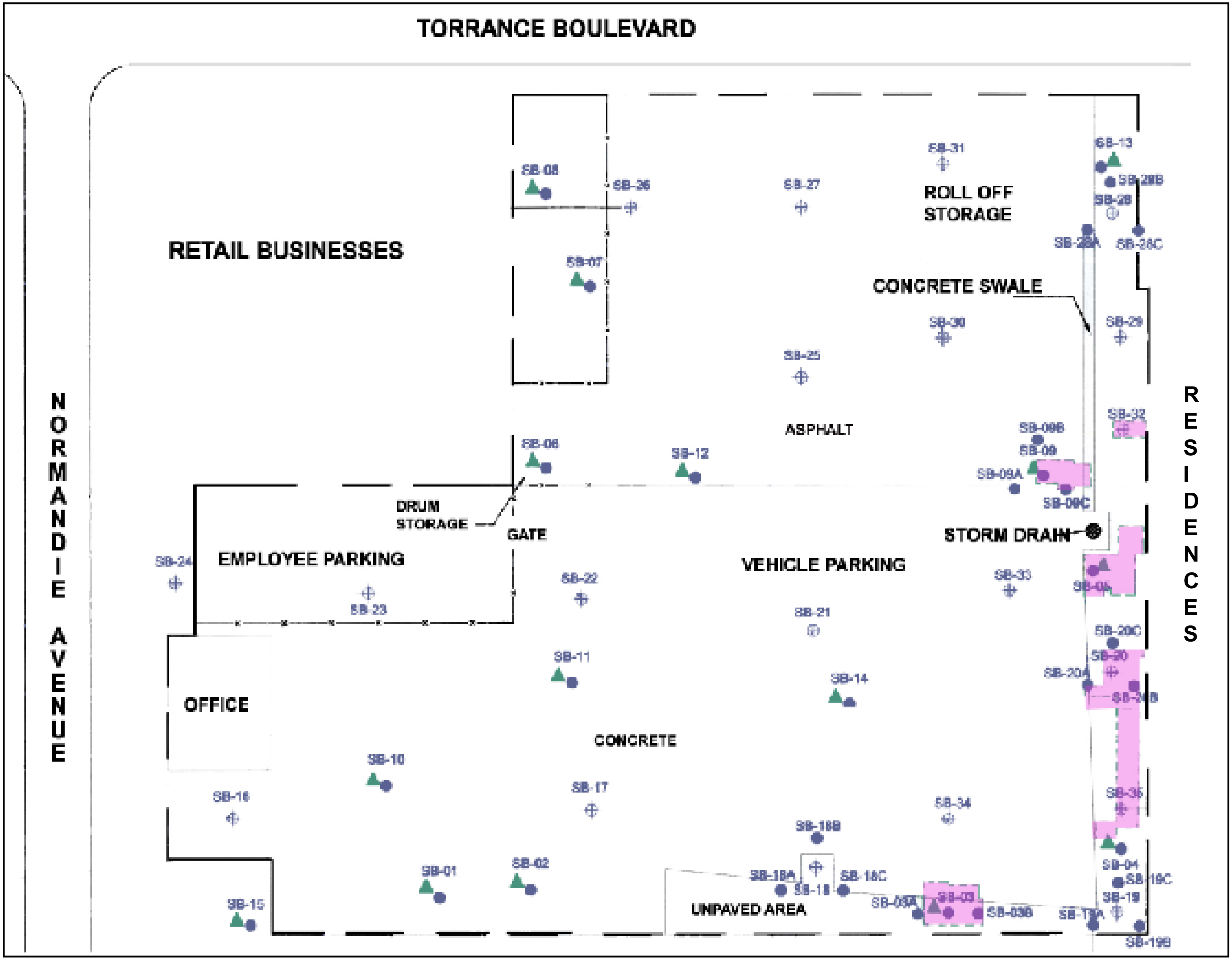
SFO \\SFOGIS\PROJECTS\EPA_MONTROSE\MXDS\V6\FIG33_COMPOSITE.MXD FIG33_COMPOSITE.PDF 10/18/2005 16:25:23



U.S. EPA, Region 9

Figure 3: Conceptual Diagram of Soil Across Former Stormwater Drainage Pathway

MONTROSE SUPERFUND SITE
LOS ANGELES COUNTY, CALIFORNIA



= Open Excavations (July 2005)

Figure 4: ECI Property Excavations

Sharp
Environmental
Technologies, Inc.

839 S. Beacon Street, #1967, San Pedro, California 90733 Tel (310) 505-3675 Fax (310) 548-3935

REVISED SOIL STOCKPILE REMOVAL AND SITE RESTORATION WORK PLAN VERSION 4.0

ECOLOGY CONTROL INDUSTRIES
20846 Normandie Avenue
Torrance, California 90502

Prepared for

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region IX
75 Hawthorne Street (WST-3)
San Francisco, California 94105

On behalf of

Mr. Ron Flury

ECOLOGY CONTROL INDUSTRIES
20846 Normandie Avenue
Torrance, California 90502

July 12, 2016

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Appendices

PROFESSIONAL CERTIFICATION

This *Soil Stockpile Removal Work Plan* has been prepared and approved by

Jeffrey Sharp, PG #6777, CEG #2160
Senior Geologist

STATEMENT OF LIMITATIONS

The services described in this *Revised Soil Stockpile Removal and Site Restoration Work Plan, Version 3.0* will be performed in accordance with generally accepted professional environmental consulting principles and practices.

Opinions and recommendations contained in this work plan apply to conditions existing at certain locations when services will be performed and are intended only for the specific purposes, locations, time frames, and project parameters indicated. Sharp Environmental Technologies, Inc., cannot be responsible for the impact of any changes in environmental standards, practices, or regulations after performance of services.

Any use of this work plan by a third party is expressly prohibited without a written, specific authorization from the client and Sharp Environmental Technologies, Inc. Such authorization will require a signed waiver and release agreement.

This work plan is issued with the understanding that the client, the property owner, or its representative are responsible for ensuring that the information, conclusions, and/or recommendations contained herein are brought to the attention of the appropriate regulatory agencies, as required.

1. INTRODUCTION

Sharp Environmental Technologies, Inc. (SET), prepared this *Revised Soil Stockpile Removal Action and Site Restoration Work Plan, Version 4.0* (Work Plan) detailing the proposed work for contaminated soil management, transport and off-site disposal along the eastern property boundary at Ecology Control Industries (ECI), 20846 Normandie Avenue, Torrance, California 90502, and hereinafter referred to as the site (Figure 1 – Site Vicinity Map).

On behalf of ECI, this Work Plan has been prepared pursuant to the requirements by the United States Environmental Protection Agency (EPA) Unilateral Administrative Order for Removal Action (UAO), CERCLA Docket No. 2016-01 to address stockpiled soils contaminated with chemicals of concern (COCs) at the eastern property boundary of the site and the associated modification dated March 9, 2016 (USEPA, 2016). The contaminated soils are stockpiled on-site, and the stockpiles must be properly managed and either backfilled on-site at a depth that does not pose a risk to future residents or transported for off-site disposal. The Work Plan includes the objectives, methodologies and activities for conducting the stockpile removal action, a description of the on-site contamination, and the goals to be achieved by the removal action, as required by EPA.

This Work Plan has been prepared in response to the EPA UAO. Refer to **Appendix A** for a copy of the UAO. Prior versions of this Work Plan were submitted to EPA on February 11 and March 31, 2016. EPA commented on the March 31 version of the Work Plan (Version 2.0) in a letter dated April 28, 2016. This revised version of the Work Plan fully replaces the prior versions.

Environmental site assessments were previously conducted at the site. Elevated levels of the COCs were detected in the site soils that pose a potential threat to human health and/or the environment assuming potential future residential use. Based on the data collected during the investigations, EPA then the state of California, Department of Toxic Substances Control (DTSC) determined that a remedial response was required to address the potential threat or hazard posed by the presence of elevated levels of the COCs detected at the site for unrestricted residential reuse scenarios. Initial UAOs by EPA in 2005 and 2006 required investigation and remedial action. Recent remedial responses overseen by the DTSC pursuant to the DTSC approved Removal Action Work Plan (RAW), (Sharp, 2015) resulted in the onsite soil stockpiles.

ECI has and continues to respond to paragraph 46, part "a" of the UAO by securing and managing the four site soil stockpiles. It is our understanding that ECI's counsel is providing information to EPA to respond to paragraph 46, part "b" of the UAO. The waste determination required by paragraph 46, section C, was provided to EPA. EPA concurred with the determination's conclusion that the stockpiled soils are not hazardous under federal law. A Soil Stockpile Management Plan dated November 17, 2015 was submitted to the EPA RPM to address paragraph 46, part "d" of the UAO.

The site has an approved County of Los Angeles, Building and Safety Division grading plan prepared jointly by BA Sims Engineering, B&S Engineering, GeoTek, Inc. and David Moss Associates, Inc. for backfilling requirements associated with remedial actions performed during July 2015 with the RAW in anticipation of remediating the ECI site to meet California residential land use standards. To address paragraph 46, part "e" of the UAO, the soils engineering firm GeoTek which has been overseeing recent grading activities at the site recommends backfilling the open excavation at the northeast corner of the site to stabilize the cut slope following the approved grading plan. Pending receipt and review of requested information on reported structural damage associated with July 2015 remedial excavation activities a professional engineer will assess and report on any damage.

2. OBJECTIVE

The objective of this Work Plan is to present a scope of work to complete the soil removal actions to reduce the threat to human health and the environment for residential use at the site. A sampling and analysis plan including a field sampling plan, and associated quality assurance project plan (QAPP), a transportation plan for waste disposal and a health and safety plan detailing procedures for worker protection during the course of the project are provided in this Work Plan.

The EPA has assumed oversight responsibility as the lead agency as it relates specifically to the sampling, removal and disposal of the stockpiled soil. Objectives that are protective of human health and the environment and will reduce the potential for exposure to the COCs in soil encountered at the site are presented below.

- Minimize exposure of residents to the contaminants of concern in soil through inhalation, dermal absorption, and ingestion.
- Minimize potential for migration of the contaminants of concern from the soil to other media. Backfill or remove impacted stockpiled soil that exceed human health risk criteria, to prevent exposure to the COCs present in the four soil stockpiles.

Additional site remedial objectives include:

- Remediate the site to a physical condition that is compatible with single-family residential use.
- Obtain a written determination from EPA that restored conditions at the site are acceptable for residential use.

2.1 Human Health Risk Criteria

Removal of impacted soil that exceeds the human health risk criteria (for direct exposure) for the following COCs:

- The California Human Health Screening Level (CHHSL) of 0.089 milligrams per kilogram (mg/kg) for polychlorinated biphenyls (PCBs) in residential soil. This screening level is lower than the corresponding EPA Regional Screening Levels (RSL) which range from 0.17 to 6.7 mg/kg for the various Aroclors.
- The lower of the CHHSLs and RSLs for organochlorine pesticides (OCPs) in residential soil:
    - 0.033 mg/kg for aldrin
    - 0.5 mg/kg for lindane (gamma-BHC)
    - 0.43 mg/kg for chlordane (all forms)
    - 0.034 mg/kg for dieldrin
    - 0.13 mg/kg for heptachlor

  - or 0.46 mg/kg for toxaphene

- The residential background level of 10 mg/kg total DDT established by EPA for the historical stormwater pathway along Kenwood Avenue (USEPA, 2001). In 2001 and following an extensive neighborhood investigation, EPA conducted a soil removal action at more than 20 residential properties located along the historical stormwater pathway north of the ECI property. In support of that removal action, EPA conducted a background study of total DDT in residential soils. Based on more than 70 samples collected from residential properties located 2 to 4 miles from the historical stormwater pathway, EPA determined that background levels of total DDT were present in residential soils at concentrations up to 10 mg/kg. In evaluating the health risk for that removal action, EPA determined that total DDT concentrations up to 170 mg/kg in soil posed insignificant risks of health effects even to residents exposed to soil daily for up to 30 years. EPA identified 17 mg/kg as the residential risk-based health criteria for shallow soils, representing a 1×10^{-5} cancer risk, but elected to remediate the residential properties along Kenwood Avenue to the background level of 10 mg/kg total DDT. EPA determined that properties restored to this background level of total DDT would be usable for residential purposes without restriction. EPA's rationale for selecting a practical cleanup goal of 10 mg/kg was also partially based on the upper detection limit of the DDT field test kits used during the removal action. The previously established residential cleanup goal is adopted as a conservative approach for site cleanup at the ECI property. Total DDT is defined as the sum of isomer concentrations for dichlorodiphenyldichloroethane (DDD), dichlorodiphenyldichloroethene (DDE), and dichlorodiphenyltrichloroethane (DDT).

- The RSLs for volatile organic compounds (VOCs) in residential soil including the following constituent detected during soil investigation activities in 2013:
  - 24 mg/kg for tetrachloroethylene (PCE)

- The RSLs for semi-volatile organic compounds (SVOCs) in residential soil including the following constituents detected during soil investigation activities between 2013 and 2015:
  - 18,000 mg/kg for anthracene
  - 0.16 mg/kg for benzo(b)fluoranthene
  - 39 mg/kg for bis(2-ethylhexyl)phthalate
  - 2,400 mg/kg for fluoranthene
  - 1,800 mg/kg for pyrene

- A screening level background concentration of 10 mg/kg for arsenic in residential soil, consistent with the characterization goal established for supplemental soil investigation activities at the Montrose Superfund Site.

- In the absence of an established background concentration, the CHHSLs for metals in residential soil including the following constituents detected during soil investigation activities between 2013 and 2015:
  - 5,200 mg/kg for barium
  - 16 mg/kg for beryllium
  - 1.7 mg/kg for cadmium
  - 17 mg/kg for chromium

- o 660 mg/kg for cobalt
- o 3,000 mg/kg for copper
- o 80 mg/kg for lead
- o 18 mg/kg for mercury
- o 380 mg/kg for molybdenum
- o 1,600 mg/kg for nickel
- o 380 mg/kg for selenium
- o 5 mg/kg for thallium
- o 530 mg/kg for vanadium
- o 23,000 mg/kg for zine

And exceeds the following environmental risk criteria:

- The maximum soil screening level of 500 mg/kg for total petroleum hydrocarbons as gasoline (TPHg), 1,000 mg/kg for total petroleum hydrocarbons as diesel (TPHd) and 10,000 mg/kg for total petroleum hydrocarbons as oil (TPHo) in soils developed by the Los Angeles Regional Water Quality Control Board (LARWQCB) for petroleum hydrocarbon impacted sites assuming a depth to groundwater between 20 and 150 feet. EPA RSLs for total petroleum hydrocarbons range from 82 mg/kg for low aromatics (using benzene as the representative compound) to 230,000 mg/kg for high aliphatics (using white mineral oil as the representative compound). However, the ranges of hydrocarbons assumed by EPA do not match those established by LARWQCB or reported by the analytical laboratory.

The remedial goals developed and adopted for contaminated soil at the site will be responsive to these remedial action objectives. The primary remedial goal for the site is to reduce the health risk to potential future residents under reasonable exposure scenarios. The goal of the remedial action is to remove soil containing COCs in excess of the human health risk criteria under future residential exposure scenarios. EPA will certify that all necessary response actions have been completed in accordance with the approved Work Plan.

2.2 Exposure Assumptions

The DTSC PEA Guidance Manual (DTSC, 2015, last updated Oct. 2015) specifies use of a residential land use exposure scenario. Exposure assumptions used for the residential land-use evaluation are based on default assumptions presented in the DTSC PEA Guidance Manual. Primary assumptions include an exposure frequency of 350 days per year and exposure duration of 6 years and 24 years for child and adult exposures, respectively.

Residential redevelopment of the ECI property is planned as shown in **Figure 7**. Although not yet finalized, residential redevelopment plans reflect installation of 87 single family homes on the property with individual residential lots. During health risk assessment (ITSI, 2010), Innovative Technical Solutions, Inc. (ITSI) considered both a 0 to 5 feet below ground surface (bgs) and a 0 to 16 feet bgs exposure scenario. The 0 to 5 feet bgs scenario included direct soil exposure for hypothetical future residents. The 0 to 16 feet bgs scenario included construction or utility worker exposure and hypothetical future resident exposure during installation of an in-ground swimming pool. Although the planned residential redevelopment does not support installation of in-ground swimming pools by future residents due to the limited dimensions of the lots surrounding the homes, no exposure depth assumption will be used for soils within the residential lot lines. In support of the planned residential redevelopment, soils containing COCs in excess of the health risk criteria at any depth within the residential lot lines will be excavated. As shown in Figure 7, there are seven locations within the planned residential lots where COC concentrations in soil exceed the health risk criterion (i.e., Borings B24, B32, P-01, P-19, P-25, P-26, and P-31). None of the soil investigation borings located within the residential lots contain total DDT in excess of 10 mg/kg.

2.2.1 Deed Restrictions

As shown in Figure 7, the remedial excavation in the northeastern corner of the property is overlain by a roadway and parking, not residential homes or yards. There is additionally a Los Angeles County Flood Control District easement that passes through the eastern portion of the property and beneath the proposed roadway. Within the easement and roadway, there will be no residential exposure. Only future utility construction workers have the potential for direct soil exposure within the easement and planned roadway. Consequently, ECI proposes to establish deed restrictions for the roadway and parking areas east of the residential lots that will be part of the homeowner's association property (see Figure 7 for proposed extent of the deed restricted area). The deed restrictions will limit future use of the homeowner's association property to prevent unauthorized exposure to the COC-impacted soils. Construction of residential lots within the deed restricted area, or other uses that could potentially result in unauthorized exposure to COC-impacted soils, would be prohibited. The deed restrictions would additionally establish notification requirements, including notification of EPA, for property uses or activities with the potential to encounter COC-impacted soils. Any changes in the property use or conditions would also trigger the notification requirements. A Soil Management Plan would be established as part of the obligations under the deed restrictions to ensure that future soil handling is conducted in accordance with protocols approved by EPA. The deed restrictions will run with the land and be transferred with the property if sold in the future.

Within the deed restricted area, an exposure depth of 5 feet bgs is assumed to allow unrestricted use within the upper 5 feet (e.g., landscapers) and restricted use at depths exceeding 5 feet (e.g., deep utilities). Soils containing COCs exceeding the health risk criteria within the upper 5 feet would be excavated and removed from the proposed deed restricted area to support property redevelopment and future property maintenance activities. The deed restrictions will only apply to soils below 5 feet bgs within the eastern roadway and parking areas in the vicinity of the historical stormwater pathway. Soils within all other areas of the site would be restored for unrestricted residential use. Proposed or example deed restrictions are provided in **Appendix F**.

2.3 Removal Action Scope of Work

2.3.1 Work Completed

The remedial excavation was performed in the area of the historic storm water pathway and is identified in Figure 2 – Site Map. With the results of previous investigations, SET defined the limits of the required excavation to maximize the removal of contaminated soil and included:

- Pre-fieldwork preparation, including obtaining permits, USA notification;
- Trenching along the eastern property boundary;

- Soil excavation and stockpiling;
- Confirmation sampling and analysis;
- Backfill of excavated area (incomplete; only partially backfilled);
- Preparation of a report summarizing the remedial excavation (pending).

All work was performed under the supervision of a Professional Geologist (PG) licensed in California in compliance with the requirements of the Geologist and Geophysicists Act, Business and Professions Code sections 7800–7887.

2.3.2 Proposed Work to be Completed

The proposed work remaining to complete the removal action includes the following:

- Proper management of the existing soil stockpiles which contain the contaminated soil previously excavated;
- Field sampling of the stockpiled soil for analysis to establish a proper waste profile and classification, as needed;
- Excavation of soil containing total DDT, PCBs, other COCs in excess of the residential risk criteria as follows:
    - At any depth within residential lot lines, and
    - At depths less than 5 feet bgs within any deed restricted areas that are part of the homeowner's association (i.e., eastern roadway and parking);
- Backfilling of clean fill or stockpiled soil with COCs below the health risk criteria in all excavation areas;
- Approval for disposal of stockpiled soils from a disposal facility and EPA Region 9 currently South Yuma Landfill in Yuma, CA under ECI EPA # CAL000278605;
- Loading and transportation of stockpiled soil to the approved disposal facility.

If ECI elects to not establish deed restrictions under the eastern roadway and parking areas for any reason, the scope of work provided in **Appendix G** will be completed. In accordance with the April 28, 2016 EPA comment letter, the contingent removal action in Appendix G would also be implemented if ECI has not recorded a land use convenant at least one month before the ECI property is to be transferred to a new owner. The rationale for this approach is to allow sufficient time to complete the work scope before transfer of property ownership.

2.4 Extent and Volume of Soil Removal

The volume of all stockpiled soils currently on-site are estimated as follows:

- Stockpile #1: 50 feet long by 50 feet wide by 8 feet high = 740 cubic yards
- Stockpile #2: 75 feet long by 60 feet wide by 15 feet high = 2,500 cubic yards
- Stockpile #3: 60 feet long by 60 feet wide by 16 feet high = 2,133 cubic yards
- Stockpile #4: 135 feet long by 45 feet wide by 11 feet high = 2,475 cubic yards

The total volume of stockpiled soil at the site currently is 7,848 cubic yards. SET proposes to excavate an additional 4,000 cubic yards of soil from the areas surrounding 12 soil borings (**Figures 8 and 9**) as described in Section 7.9 and summarized as follows:

- 3,300 cubic yards of soil potentially containing PCBs in excess of the health risk criterion,
- 400 cubic yards of soil potentially containing total DDT in excess of the health risk criterion, and
- 300 cubic yards of soil potentially containing other COCs (TPHg and benzo(b)fluoranthene) in excess of the health risk criteria.

There is clean overburden at some of the proposed excavation areas, i.e., soils with COCs below the health risk criteria. ECI proposes to segregate the clean overburden from the COC impacted soils during excavation, which is expected to reduce the volume of soil containing COCs above the health risk criteria to approximately 1,600 cubic yards (1,000 cubic yards of PCB-impacted soils, 300 cubic yards of total DDT-impacted soils, and 300 cubic yards of TPHg and benzo(b)fluoranthene-impacted soils).

Soil will be sampled for laboratory analysis to determine waste classifications prior to off-site disposal or backfilling. Refer to Figure 6 for the approximate location of the soil stockpiles and soil samples at the site and to Table 1 for soil sample analytical results from the existing soil stockpiles.

2.5 Fate and Transport of Pesticide COCs

The primary pesticide COCs within the eastern portion of the Site and along the historical stormwater pathway are 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT. The fate and transport of these pesticide COCs in the environment can be described based on their physical properties and persistence. These pesticide COCs have a high carbon partitioning coefficient and will bond strongly to soil particles. These pesticide COCs are relatively non-volatile and will not partition into soil gas or pose a future risk to indoor air. These pesticide COCs are also relatively insoluble in water and will not pose an environmental risk to underlying groundwater resources. The primary routes for human or ecological exposure to these pesticides COCs are via direct contact in surface or shallow soils. In deeper soils, where there is little or no potential for human exposure, these COCs will not pose a human or ecological health risk. These pesticide COCs tend to persist in the environment due to a relatively long degradation half-life, particularly in terrestrial environments. Although these pesticide COCs can persist in the environment for long periods of time, they are not mobile. Additional details regarding the fate and transport of these pesticide COCs can be found in the *Final Remedial Investigation Report for the Montrose Superfund Site* (USEPA, 1998).

3. SITE DESCRIPTION

The site is located at 20846 Normandie Avenue in Torrance, California 90502 (Figure 1). The ECI property comprises of four parcels identified by Los Angeles County Assessor numbers 7348-020-003, 004, 007, 008, 009 and 010.

The site consists of an 8.68-acre property currently occupied by ECI as a vehicle and equipment dispatch yard and a temporary hazardous and non-hazardous waste storage facility. The subject site contains one 5,400-square foot building located along the northern property line and is approximately

90 percent covered with either concrete or paved asphalt, with the remaining area consisting of unpaved soils (Figure 2).

4. ENVIRONMENTAL BACKGROUND

4.1 Property Ownership and Business Type

The property is owned by Mr. Ron Flury and is currently occupied by Ecology Control Industries as a vehicle and equipment dispatch yard and a temporary hazardous and non-hazardous waste storage facility.

4.2 Contaminant Discovery

In 2005, pesticides and PCBs were detected in soil by ECI as part of due diligence activities prior to sale of the property. The due diligence sampling activities detected several chemicals present in soils at concentrations exceeding residential action levels, including: DDT, DDE, DDD, chlordane, petroleum hydrocarbons, and PCBs. The sum of DDT, DDE, and DDD concentrations (referred to collectively as total DDT) were detected in subsurface soil samples collected from the eastern and southeastern portions of the ECI property in concentrations up to 325 mg/kg. Although contended by Montrose, EPA has attributed the presence of total DDT in these soils to former Montrose chemical manufacturing activities. From 1947 to 1982, Montrose manufactured technical grade DDT at a plant located approximately 0.5 miles north/northwest of the ECI property. EPA believes that DDT-impacted soils at the ECI property may be the result of contaminated storm water runoff from the former Montrose plant. The ECI property is located “downstream” from the former Montrose plant property, by way of the historical storm water drainage pathway.

Although many of the chemicals (some pesticides and all PCBs) detected at the ECI property are not related to past Montrose operations and although Montrose disputes EPA’s conceptual model for DDT transport via the historic storm water pathway, Montrose nonetheless agreed to conduct additional soil investigation activities at the ECI property. Accordingly, a Field Sampling Plan (FSP; Earth Tech, June 2006a) and Quality Assurance Project Plan (QAPP; Earth Tech, June 2006b) for additional soil sampling and analysis at the ECI property were submitted to EPA for review on June 2, 2006. EPA conditionally approved the draft plans in a letter dated June 21, 2006. EPA then issued Unilateral Administrative Order (UAO) 09-2006-022 on June 23, 2006 for additional soil investigation activities at the ECI property. The initial phase of Montrose field soil sampling activities at the ECI property occurred between July 10 and 24, 2006 (Earth Tech, 2008).

The EPA Historic Storm Water Pathway – South Study Area is located south of Torrance Boulevard and east of Normandie Avenue in Torrance, California, and includes portions of eight properties. The eight properties include ECI and seven residential properties located directly east of the ECI property along Torrance Boulevard, Raymond Avenue, and 209th Street. The residential properties are the subject of a separate investigation being performed by CH2M HILL, Inc. under contract to EPA. This Work Plan addresses only the ECI property, including that portion of the property traversed by the historic storm water pathway.

4.3 Recent/Relevant Environmental Investigations

Recent assessments at the site were documented in the following reports, which are summarized below:

- *Environmental Site Assessment* (Haley & Aldrich, Inc. (HAI), 2005)
- *Draft Soil Investigation Report* (Earth Tech, 2006)
- *Summary Report - Human Health Risk Evaluation* (HAI, 2006)
- *Revised Soil Investigation Report, Historic Storm Water Pathway* (Earth Tech, 2008)
- *Final Human Health Risk Assessment* (Innovative Technical Solutions, Inc. [ITSI], 2010)
- *Phase II – Environmental Site Assessment* (SET, 2014)

The complete site assessment history from 1984 through 2010 from has been summarized in SET's *Site Assessment History Summary Report* dated May 22, 2014. The report includes summaries of all available documents to date with exception of the 2014 assessment by SET. A summary of the most recent assessment by SET is included below.

4.3.1 2005 Environmental Site Assessment Report – Haley & Aldrich, Inc.

In 2005, ECI commissioned implementation of an Environmental Site Assessment (ESA) at its property for real estate divestiture purposes. HAI was contracted by ECI to perform the work and collected and analyzed over 200 soil samples from the entire ECI property from February to June 2005. ECI excavated soil in areas where the results of the initial soil sampling indicated chemical concentrations above residential human health standards. HAI performed confirmation soil sampling at ECI from March to June 2005. During investigation of the ECI site, the resulting laboratory analyses reported the detection of a number of pesticides including: DDT, DDE, DDD, benzene hexachloride (BHC: alpha, beta, delta, and gamma isomers), chlordane (alpha and gamma isomers), dieldrin, endrin aldehyde, endrin ketone, heptachlor and heptachlor epoxide, and toxaphene. The laboratory reported the detection of TPH as diesel fuel and motor oil ranges, and the detection of PCBs, specifically Aroclors 1254 and 1260.

Many of the soil samples collected were grab samples taken from the sidewalls of excavations created along the eastern portion of the ECI property. The depth of sample collection ranged from just below ground surface to approximately 15 feet.

The soil analytical results identified elevated concentrations of several chemicals. Chemicals affecting soils at concentrations exceeding federal or state regulatory limits or regional background concentrations for residential soils included:

- Total DDT – Detected at a maximum reported concentration of 325 mg/kg total DDT. Samples containing elevated total DDT concentrations were collected from the eastern portion of the ECI property. Approximately 35 soil samples had total DDT concentrations above the upper end of the regional residential background range of 10 mg/kg.
- Chlordane – Detected at a maximum reported concentration of 3.5 mg/kg from soil collected along the easternmost portion of the property.
- PCBs – Detected along the southeast corner of the ECI property at a maximum concentration of 23.1 mg/kg (sum of Aroclors 1254 and 1260).

- Other chemical constituents detected in soil samples from the ECI property included:
- BHC, up to 0.025 mg/kg (sum of alpha, beta, delta, and gamma isomers);
- Dieldrin; up to 0.18 mg/kg;
- Heptachlor and heptachlor epoxide; up to 0.011 mg/kg;
- Endrin aldehyde and endrin ketone; up to 0.033 mg/kg;
- Toxaphene; up to 0.07 mg/kg;
- TPH-d and TPH-o; up to 21,000 mg/kg

In the summer of 2005, EPA learned of the presence of DDT and other chemicals in stockpiled soil at the ECI property. The ECI work was initiated without direction or oversight from the EPA. EPA requested that the owner stop excavation and implement best management practices for erosion control and other protective measures. ECI was requested to minimize erosion of the excavated soil piles, and to minimize the generation and migration of fugitive dust, potentially containing DDT and other chemicals, from the excavated soil piles. In addition, EPA requested that ECI provide all information related to its soil sampling activities including sampling locations and laboratory data reports.

In November 2005, EPA authorized ECI to perform a removal action to address the excavated soil and open excavations. On December 15, 2005, the EPA issued UAO Docket No. 09-2006-02a to ECI and Montrose. The UAO required the transport and disposal of the excavated soil at the ECI property, and the backfilling and covering of the open excavations. Beginning in January 2006, the soil piles were transported to a permitted hazardous waste facility for thermal treatment and landfilling. On behalf of Montrose, Earth Tech provided air monitoring of fugitive dust potentially containing DDT during the loading of soil into trucks by ECI (Earth Tech, 2006).

4.3.2 2006 Draft Soil Investigation Report – Earth Tech

The July 2006 investigation results were documented in the *Draft Soil Investigation Report – Historic Storm Water Pathways, South* (Earth Tech, December 2006) The July 2006 investigation characterized the nature and extent of pesticides and PCBs along a series of east-west transects positioned roughly perpendicular to the direction of the historical stormwater flow. Soil borings were spaced close together along each transect (30-feet) in order to provide a high level of characterization, but the spacing between transects was increased to 60 feet to reduce the number of borings required during the initial phase of historical stormwater pathway characterization. The approach used during the 2006 investigation characterized the nature and extent of pesticides and PCBs along the investigation transects.

A portion of the July 2006 soil samples exhibited pesticide and PCB concentrations exceeding the characterization benchmarks established by EPA for the investigation. In accordance with the UAO, EPA requested that soil samples be collected from selected locations between the July 2006 transects to further characterize the nature and extent of pesticides and PCBs within the ECI portion of the historical storm water pathway (i.e. a higher boring density). Additionally, vertical delineation of pesticides and PCBs was required at a small number of locations where the deepest soil sample was found to contain chemical concentrations exceeding the characterization benchmarks. Based on the July 2006 results, a supplemental soil sampling program was implemented at the ECI property in May 2007 to further characterize the nature and extent of pesticides and PCBs within the ECI portion of the historical storm water pathway. EPA conditionally approved the *Draft Field Sampling Plan Addendum* (Earth Tech, 2007) in an Interim Conditional Approval letter dated April 27, 2007.

Data obtained from the Montrose soil sampling efforts, in combination with existing ECI property data and additional data collected by EPA in the residential portion of the study area, were intended to fully characterize the presence, distribution, and concentrations of pesticide/PCB chemicals in the study area soils and identify those soils, if any, requiring remedial action.

4.3.3 2006 Human Health Risk Evaluation – Haley & Aldrich, Inc.

In 2006, Haley & Aldrich conducted a human health risk evaluation (HHRE) at the site with the purpose of assessing whether estimated human health risks at the site, based on the results of on-site soil and soil-gas samples previously collected by HAI in 2005, are considered acceptable for on-site commercial/ industrial uses.

A subsurface soil investigation and limited remedial excavation activities were performed at the subject site between February and June 2005 to assess current on-site soil conditions. Soil matrix and soil-gas samples were collected to address historical operations (presence of former underground storage tanks and chemical storage areas), possible historical agricultural use at the site, and other chemical uses in proximity to the site. Soil matrix samples were obtained from soil borings and within the remedial excavations. Soil-gas samples were obtained throughout the site.

No volatile organic compounds (VOCs) were detected in the soil-gas samples. The information from these investigation and remedial excavation activities was used in the HHRE

The results of the HHRE indicated the total hazard index (HI) and the cumulative incremental lifetime cancer risk (ILCR) for the identified receptors at the site are less than the acceptable thresholds for HI and ILCR of 1.0 and 1 x 10-5, respectively. Therefore HAI concluded that the contaminants of potential concern (COPC) concentrations detected at the site do not pose a significant risk to human health for an on-site commercial/industrial worker or a construction worker. Based on these results, the subject site is suitable for commercial/industrial land uses.

4.3.4 2008 Revised Soil Investigation Report – Earth Tech

On behalf of Montrose Chemical Corporation of California (Montrose) and in compliance with Unilateral Administrative Order (UAO) 09-2006-022, Earth Tech submitted a revised investigation report to the EPA. The EPA requested that Montrose conduct further soil investigation for the presence of pesticides and PCBs located along a portion of the historic storm water pathway that traverses the ECI property.

The objective of the ECI investigation was to obtain additional analytical data adequate to characterize the vertical and lateral extent of pesticides and PCBs in soil within the ECI portion of the Historic Storm Water Pathway – South Study Area.

Fifteen pesticides (excluding isomers of the same chemical) and three PCB Aroclors were detected in the soil samples collected at the ECI property and northern embankment. Nine of the pesticides and the PCBs occurred in concentrations exceeding EPA regional screening levels (RSLs), CHHSLs, or characterization benchmarks in at least one sample. Of these chemicals, total chlordanes, dieldrin, total

DDT, and total PCBs occurred most frequently and in the highest concentrations. At the ECI plant property, shallow soils in the upper 8 feet (0 to 8 feet below ground surface [bgs]) were impacted most frequently by total chlordanes, dieldrin, and total PCBs, with up to 3.7 percent of the samples containing pesticides/PCBs in excess of the characterization benchmarks. Deeper soils at the ECI plant property (8 to 24 feet bgs) and soils along the northern embankment were most frequently impacted by total DDT, with up to 20.1 percent of the samples containing total DDT in excess of the characterization benchmark. None of the samples collected below 24 feet bgs were impacted with pesticides or PCBs above the characterization benchmarks.

The vertical extent of pesticides/PCBs exceeding residential action levels in soils was effectively delineated by the investigation activities conducted in 2006 and 2007, with the exception of PCBs in boring P10 (Figure 5). The deepest sample collected at this boring (20 to 24 feet bgs) exhibited a total PCB concentration of 0.58 mg/kg, exceeding the benchmark of 0.089 mg/kg. However, because PCBs are not a chemical of concern at the Montrose Superfund site and because boring P10 was located within the LACFCD easement (no native soils until at least 26 feet bgs), EPA did not require vertical delineation of PCBs at this location. The vertical extent of total chlordanes and dieldrin impacts to soil at the ECI plant property was found to be 12 and 16 feet bgs, respectively. The vertical impact of total DDT impacts to soil at ECI was found to be 24 feet bgs. In 2007, 12 borings were drilled to a depth of 28 feet bgs, and none of the soil samples collected below 24 feet bgs were found to contain total DDT above the characterization benchmark. The average total DDT concentration measured in soils classified as native by CH2M Hill was 0.158 mg/kg, which is significantly below the characterization benchmark of 10 mg/kg. It is important to note that none of the native soil was impacted by total DDT above the benchmark. All of the soil impacted by total DDT above the benchmark at the ECI property was classified as either fill or reworked materials.

The lateral extent of pesticides/PCBs exceeding residential action levels in soils throughout the historical storm water pathway was effectively delineated by the investigation activities conducted in 2006 and 2007. Soil borings were drilled in 30-foot intervals from the western boundary of the historical storm water pathway to the eastern boundary of the ECI property. Soil borings were also drilled in 30- to 60-foot intervals along the entire length of the historical storm water pathway from north to south. The soil investigation activities effectively delineated the western extent of total DDT, total chlordanes, and dieldrin impacts to soil in all areas of the historical storm water pathway as shown in Figure 5. The western extent of total PCB impacts to soil was delineated in all areas, except at boring P01, P25, and P31. At these three borings, total PCBs were detected in concentrations between 0.138 and 3.000 mg/kg, exceeding the residential action level of 0.089 mg/kg. However, EPA did not require further delineation of PCBs to the west because PCBs are not a chemical of concern at the Montrose Superfund site and because areas to the west would not be within the historical storm water pathway. Delineation to the east of the ECI property was the subject of a concurrent soil investigation conducted by EPA.

On September 13, 2007, based on the investigation data collected in 2006 and 2007, EPA concluded that Montrose had satisfactorily characterized the nature and extent of pesticides/PCBs within the portion of the historical storm water pathway traversing the ECI property. No additional investigation activities were proposed and submittal of the investigation report fulfilled Montrose's obligations under the UAO.

4.3.5 2010 Final Human Health Risk Assessment Report – ITSI

As part of UAO 09-2006-022, ITSI prepared a baseline Human Health Risk Assessment (HHRA) for the USEPA, Region 9 to provide a quantitative evaluation of the potential human health risks associated with theoretical exposures to chemicals in soil at the ECI site. The report relied upon data collected during the additional soil investigations conducted at the ECI property by Earth Tech to quantify potential health risks for future on-site populations including adult and child residents, adult industrial workers, and construction workers. Exposure pathways addressed for these populations included soil ingestion, dermal contact, and particulate inhalation for soil from 0 to 2 feet below ground surface (bgs) (residential and industrial worker scenarios), 0 to 5 feet bgs (residential scenario), and 0 to 16 feet bgs (residential and construction worker scenarios). A 0 to 16 feet bgs exposure scenario was assumed for construction workers or hypothetical future residential redevelopment assuming in-ground swimming pool construction. Two exposure point concentrations were used for each of these scenarios, i.e., the maximum detected concentration and the 95 percent UCL.

Results of the baseline HHRA demonstrated that the increased likelihood of cancer risk from soil exposures is due primarily to 4,4′-DDT. Although residential reuse of the site would pose the highest estimated cancer risk, the increased likelihood of cancer risk is within EPA's risk management range of one in 1 million (10^{-6} or 1E-06) to one in 10,000 (10^{-4} or 1E-04) if residents are not exposed to soil deeper than 16 feet bgs. For the future resident, the additional likelihood of cancer risk due to chemical concentrations in soil from surface to 16 feet bgs increases with depth.

If the site remains an industrial facility, increased cancer risk due to potential soil exposures of industrial workers is also within the risk management range. Exposures of construction workers to soils within the 0-to-16-foot bgs range also are associated with increased cancer risk that is within the risk management range. The risk assessment assumes that excavation and/or redevelopment activities will take place over a period of one year. In the event that these activities were for a shorter duration, the estimated cancer risk would decrease correspondingly.

The risk assessment also acknowledged that TPH contamination still remains at the site, and that TPH is a chemical of concern that needs further characterization prior to site redevelopment. Tetrachloroethene (PCE) was detected in one location with a concentration of 5.5 mg/kg. ITSI concluded that for future reuse other than as a parking lot, the potential vapor intrusion pathway, which was not addressed in their HHRA, may have to be evaluated.

4.3.6 2015 Technical Memorandum – Supplemental Site Investigation – SET

Between July 26, 2013 and March 19, 2015, SET conducted several soil and soil-gas investigations over primarily the mid to western portions of the site including advancing and sampling 40 borings. The purpose of the assessments were to establish potential sources of impacted soil and soil gas at the site from chemicals including volatile organic compounds, petroleum hydrocarbons, pesticides and metals originating from the historical operations on-site and offsite sources. Soil samples were collected at depths ranging from 0.5 to 45 feet bgs, although the majority of soil samples were collected between 0.5 and 5 feet bgs. The soil samples were selectively analyzed for a wide range of environmental contaminants as summarized below:

Soil samples from borings B1 through B5 and B8 through B38 were tested for the presence of TPH carbon chains by EPA Method 8015. Only one soil sample contained TPHg (510 mg/kg at 2 feet bgs in boring B24) in excess of the environmental risk criteria established in Section 2.1 (500 mg/kg). All other TPHg results were significantly below the environmental risk criteria; the next highest TPHg concentration detected at the site was 5.4 J mg/kg at 5 feet bgs in boring B24. No TPHd or TPHo were detected at concentrations exceeding their respective environmental risk criteria. The highest detected TPHd concentration was 260 mg/kg at 2 feet bgs in boring B18, and the highest detected TPHo concentration was 1,250 mg/kg at 0.5 feet in boring B11.

Soil samples from borings B1 through B15 and B36 through B40 were tested for the presence of VOCs by EPA Method 8260B. The only VOC detection was 0.009 mg/kg PCE at 30 feet bgs in boring B6, which was significantly below the health risk criteria of 24 mg/kg established in Section 2.1.

Soil samples from borings B8 through B33 were tested for the presence of SVOCs by EPA Method 8270C. SVOCs were only detected in two soil borings (B16 and B32), and only one SVOC detection, 0.49 mg/kg benzo(b)fluoranthene at 2 feet bgs in boring B32, exceeded the health risk criteria established in Section 2.1 (0.16 mg/kg). All other SVOC detections were below their respective residential health risk criteria. Additionally, no SVOCs were detected at 2 feet bgs in co-located boring B9, indicating that the extent of SVOC-impacted soil at boring B32 may be limited.

Soil samples from borings B8 through B33 were tested for the presence of metals by EPA Methods 6010/7471A. No metals were detected at concentrations exceeding their respective health risk criteria established in Section 2.1. The maximum arsenic detection in soil was 5.2 mg/kg at boring B20, which is below the background concentration of 10 mg/kg established in Section 2.1.

Soil gas samples were collected from 23 locations (borings B1 through B10, B16 through B23, and B36 through B40) at depths varying from 5 to 45 feet bgs, although predominantly at depths of 5 and 15 feet bgs. Discrete soil gas samples were collected using glass syringes after removing three purge volumes and tested for the presence of VOCs by EPA Method 8260B. A total of 25 VOCs were detected at concentrations ranging from 0.003 to 7.8 micrograms per liter (μg/L). Only one VOC detection at 5 feet bgs (0.6 μg/L PCE at boring B4) exceeded its respective screening level (0.47 μg/L CHHSL for buildings constructed with engineered fill). All other VOC detections at 5 feet bgs were below their respective screening levels (CHHSL if available or EPA RSL for indoor air multiplied by attenuation factor of 0.001). The DTSC vapor intrusion screening model (December 2014 modification) was used to establish soil gas screening levels for VOC detections at depths greater than 5 feet bgs assuming a sandy loam soil type, consistent with the lithology within the upper soil horizon at the site (i.e., the Playa Deposits)[1]. None of the VOCs detected in soil gas at depths exceeding 5 feet bgs exceeded their respective screening levels based on the DTSC vapor intrusion model. Furthermore, the estimated cumulative cancer risks due to vapor intrusion of VOCs in soil gas at the site were 1E-6 or less with one exception (1.4E-6 at boring B17).

The results of the site investigation activities were presented in the *Phase II – Environmental Site Assessment* report dated June 2, 2014, and the *Technical Memorandum – Supplemental Site Investigation* report (Revision 2) dated May 19, 2015. Contaminant concentrations in soil exceeding their respective

1 In the May 19, 2015 Technical Memorandum, screening levels at depths greater than 5 feet bgs were not calculated. VOCs in soil gas at all depths were conservatively compared against screening levels at 5 feet bgs. Additionally, cumulative cancer risks were estimated assuming a sand soil type that is substantially more permeable than the soils present at the site. Soil gas CHHSLs were additionally not considered by the Technical Memorandum.

health risk criteria are shown in **Figure 9**, and contaminant concentrations in soil gas exceeding or approaching their respective screening levels are shown in **Figure 10**.

5. ENVIRONMENTAL SETTING

5.1 Site Topography

The topography at the ECI property is generally even and planar, with a surface elevation of approximately 40 feet above mean sea level (MSL) along its western edge. The surface of the site slopes to the east to an elevation of approximately 34 feet above MSL. A localized storm water catch basin located near the LACFCD drain box (eastern boundary area) is the lowest feature within the paved ECI plant property (Figure 5).

The majority of the ECI plant property is paved with asphalt or concrete, with the exception of a narrow strip along the eastern boundary that is uncovered. Along the northern boundary of the property is a sloped and landscaped embankment bounded by Torrance Boulevard to the north. The embankment is approximately 10 vertical feet in height. In 1998, ECI removed soils from along the bank, thereby reducing the grade to its present day condition, for purposes of filling a localized depression in the northeast corner of the property (Earth Tech, 2008).

5.2 Geology and Hydrogeology

The ECI site is located within the south central portion of the West Coast Groundwater Basin. The Ballona Escarpment bounds the West Coast Groundwater Basin to the north, the Newport-Inglewood Structural Zone to the northeast, Palos Verdes Hills to the southwest, and the Pacific Ocean to the south and west.

The site is also located in the southern portion of the Torrance Plain landform element. There are four major structural features within the Torrance Plain or in the vicinity of the EPA Historic Storm Water Pathway Study Area: the Newport-Inglewood Structural Zone (Barrows, 1974), the Palos Verdes Fault, the Torrance Anticline, and the Gardena Syncline (EPA, 1998; California Department of Water Resources [CDWR], 1961). The stratigraphy of the West Coast Basin includes Quaternary-age continental and marine deposits and Tertiary-age marine sediments overlying a basement complex of igneous and metamorphic rocks. The geologic units of hydrogeologic interest are (in order from oldest to youngest) the Pico Formation; the San Pedro Formation; the Lakewood Formation; and older dune sand, alluvium, and active dune sand (CDWR, 1961).

The specific occurrence, depth, and thickness of surface and near surface sediments at the ECI property have not previously been significantly differentiated but were expected to be comprised of unconsolidated sedimentary deposits and reworked soil from past grading operations. According to CDWR (1961), the ECI property is underlain first by the Lakewood Formation and is approximately 200 feet thick in the vicinity. Generally, the Lakewood Formation comprises terrace deposits, the Palos Verdes Sand, and unnamed Upper Pleistocene deposits. Material types are both marine and non-marine, and include gravel, sand, silt, and clay. Near surface soils from the nearby Montrose Superfund Site were described as follows in the 1998 Remedial Investigation (RI) Report (EPA, 1998):

Upper Layer – Playa Deposits: This layer occurs from near the ground surface to approximately 25 feet below ground surface. Based on grain-size analyses of soil samples collected in this layer, silt and clay comprise more than 65 percent of these soils.

Middle Layer – Palos Verdes Sands: This layer occurs from approximately 25 to 45 feet bgs and consists primarily of fine-grained sands. According to grain-size analysis of soil samples collected in this layer, fine and medium grained sands comprise more than 70 percent of these soils.

Lower Layer – Upper Bellflower Aquitard: This layer is found from approximately 45 to approximately 95 feet bgs and consists of multiple thin sand layers interbedded with layers of silts and clays. Grain-size analysis of soil samples collected in this layer ranged from more than 70 percent fine-grained sand to more than 60 percent silt. This soil layer varied from fine-grained sands to clays and silts with increasing depth.

Hydrogeologic units in the west Coast Basin include aquitards and aquifers of varying compositions and water-yielding properties. These units, in order from shallow to deep, include the Bellflower Aquitard, the Gage Aquifer, an unnamed aquitard, the Lynwood Aquifer, another unnamed aquitard, and the Silverado Aquifer. The first-encountered groundwater beneath the area is at approximately 65 feet bgs, in the Upper Bellflower Aquitard (Earth Tech, 2008).

Groundwater quality data are available from investigations proximal to the Montrose study area; however, these data are not related to the investigations of the historical storm water pathway.

5.3 Site Geology

During the site investigations, gravel with various amounts of silt, clay, and sand was encountered fairly broadly across the area investigated to a depth ranging from surface to 5 feet bgs, followed at depth by lean to sandy clay, with occasional silty sand or sandy silt layers. A variety of debris materials were observed in a number of the soil samples collected at the ECI property including (but not limited to): brick, concrete, asphalt, plastic, wood, glass, ceramic tile, linoleum, and electrical wire. Debris materials were encountered from near surface to a maximum depth of approximately 23 feet bgs in the various soil borings logged.

Within the ECI plant property, native soils were found to occur between approximately 20 and 26 feet bgs. Fill materials overlayed the native soils. In some cases, there was an intermediate soil type between the fill materials and native soils, identified by Earth Tech as “potentially native” and by CH2M Hill as “reworked”. The reworked material is very similar to the native soils but lacking in evidence of plant roots or root channels. Where identified, the reworked material was generally thin, with thicknesses between approximately 0 and 4 feet.

5.4 Meteorology

Moderate temperatures with comfortable humidity and limited precipitation characterize the climate in Los Angeles. Temperatures are normally mild, with rare extremes above 100ºF or below freezing. Mean annual precipitation is approximately 14.5 inches, of which approximately 12.2 inches occur from November through March. Temperatures are expected to range between 70ºF and 90ºF.

6. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The most effective remedial action has been determined to be removal of stockpiled soil and off-site disposal. This section discusses the relevant and appropriate requirements for the proposed work.

6.1 Public Participation

For the 2015 Removal Action Workplan, DTSC developed a public participation strategy to determine the level of public interest and ensure that the local community has an opportunity to provide input into the decision process. DTSC performed a public participation period for the site in late 2014 for the expression of community interest with the Del Amo Action Committee (DAAC) requesting an extension. Following completion of the public participation period DTSC approved RAW.

6.2 California Environmental Quality Act

The California Environmental Quality Act (CEQA), modeled after the National Environmental Policy Act (NEPA) of 1969, was enacted in 1970 as a system of checks and balances for land-use development and management decisions in California. It is an administrative procedure to ensure comprehensive environmental review of cumulative impacts prior to project approval. It has no agency enforcement tool, but allows challenge in courts.

CEQA applies to all discretionary activities proposed to be carried out or approved by California public agencies, unless an exemption applies. The DTSC provided a Notice of Exemption for the site.

6.3 Noise Control

The project may result in potentially significant noise impacts, and as such mitigation measures are required.

The Work Plan will conform to City of Torrance standards for construction noise impacts on adjacent land as detailed below.

6.4 Waste Management

Elevated levels of pesticides and PCBs were detected in the excavation area during previous site assessments. The impacted soil has been excavated and will be backfilled or classified for off-site disposal. Based on results of the previous investigations and results of preliminary stockpile samples, all stockpiled soil to be loaded and hauled off-site is classified as non-RCRA waste. In a letter dated December 14, 2015 (USEPA, 2015), EPA Region 9 determined that the stockpiled soil at the Site is not classified as a listed U-code waste. This determination is consistent with the waste classification previously established for the Site in 2005.

If laboratory results exceed the total threshold limit concentration (TTLC) or soluble threshold limit concentration (STLC), the waste will be classified as non-Resource Conservation and Recovery Act (non-RCRA) California regulated hazardous waste, and if the results exceed the toxicity characteristic leaching procedure (TCLP) limit then the waste will be handled as RCRA hazardous waste. The TTLC, STLC, and TCLP limits for hazardous waste classification is outlined in the following table.

Compound	TTLC Limit (mg/kg)	STLC Limit (mg/l)	TCLP Limit (mg/l)
Chlordane	2.5	0.25	0.03
4-4-DDD	1.0	0.1	NA
4-4-DDE	1.0	0.1	NA
4-4-DDT	1.0	0.1	NA
Dieldrin	8.0	0.8	NA
Toxaphene	5.0	0.5	0.5
TPH(cc)	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA

NA = Not applicable
mg/kg = Milligram per kilogram
mg/l = Milligram per liter

Compliance with all requirements of hazardous waste generation, temporary on-site storage, transportation and disposal is required, as necessary. Any container used for on-site storage will be properly labeled with a hazardous waste label. Within 90 days after its generation, the hazardous waste will be transported off-site for disposal. Any shipment of hazardous wastes in California will be transported by a registered and licensed hazardous waste hauler under a uniform hazardous waste manifest. ECI will sign all manifests as the hazardous waste generator. Land ban requirements will also be followed as necessary.

6.5 Air Quality Monitoring

The South Coast Air Quality Management District (AQMD) has two rules that address excavation (Rules 1150 and 1166) and one that addresses fugitive dust (Rule 403). Rule 1150 applies to the excavation of sanitary landfills and does not apply to this project. Rule 1166 applies to the project excavations of soils because of the potential for containing volatile organic compounds (VOCs). SET will provide and comply with the Rule 1166 Various Locations Permit to complete the project at the site.

Several elements of Rule 403, such as protocols for mitigation of potential fugitive dust emissions, have been incorporated into this Work Plan. Loading and transport of impacted soils will be in compliance with AQMD Rule 403 prevention, reduction, and mitigation measures for fugitive dust emissions. However, notification of the AQMD is required only for large operations (disturbing more than 100 acres or moving more than 10,000 cubic yards per day). The estimated daily mass of material removed from the site will be approximately 1,000 tons/day. Therefore, no notification or filing of a Fugitive Dust Emission Control Plan is required due to project size.

6.6 Health and Safety

All contractors will be responsible for operating in accordance with the most current requirements of Title 8, California Code of Regulations, section 5192 (8 CCR 5192) and Title 29, Code of Federal Regulations, section 1910.120 (29 CFR 1910.120), Standards for Hazardous Waste Operations and Emergency Response (HAZWOPER). On-site personnel are responsible for operating in accordance with all applicable regulations of the Occupational Safety and Health Administration (OSHA) outlined in 8 CCR General Industry and Construction Safety Orders and 29 CFR 1910 and 29 CFR 1926, Construction Industry Standards, as well as other applicable federal, state and local laws and regulations. All personnel shall operate in compliance with all California OSHA requirements.

A site-specific HSP has been prepared for the site in accordance with current health and safety standards as specified by the federal and California OSHAs. The HSP is included as **Appendix B**.

The provisions of the HSP are mandatory for all personnel of the project and its contractors who are at the site. The contractor and its subcontractors contracted for fieldwork in association with this Work Plan will either adopt and abide by the HSP or shall develop their own safety plans which, at a minimum, meet the requirements of the HSP. All on-site personnel shall read the HSP and sign the "Approval/ Distribution of Health and Safety Plan" before starting site activities. The on-site health and safety officer will be responsible for implementation of the HSP. A health and safety meeting will be conducted at the beginning of the each day during field activities.

6.7 Quality Assurance/Quality Control

An integral part of sampling and analysis are quality assurance/quality control (QA/QC) procedures to ensure the reliability and compatibility of all data generated during the investigation. The procedures are described in detail in the QAPP (**Appendix C**). The QAPP includes project organization and responsibilities during the corrective action. Systematic planning for data collection using the EPA's Data Quality Objectives process will be applied to all aspects of the project. Data quality as measured by the precision, accuracy, representativeness, completeness, and comparability of field and laboratory data is discussed. The collection and analysis of field and laboratory control samples, including sampling frequency, is included. Quality control procedures including data quality assessment and management, data validation and reporting, and audit and corrective action programs is discussed.

The chemical data to be collected for this effort will be used to establish that the extent of contamination is properly evaluated and/or removed. As such, it is critical that the chemical data be the highest confidence and quality. Consequently, strict QA/QC procedures will be adhered to and the procedures include:

- Observation of strict protocols for field sampling and decontamination procedures; and
- Collection and laboratory analysis of appropriate field equipment blanks to monitor for contamination of samples in the field or the laboratory;
- Collection of soil duplicate samples to evaluate field precision and accuracy;
- Laboratory calibration against internal standards, surrogate recoveries, laboratory control samples, instruments blanks, method blanks, and matrix spike/matrix spike duplicate samples to evaluate analytical precision and accuracy.
- Attainment of completeness goals.

6.7.1 Stockpiled Soil Sampling

In accordance with standard EPA protocols, appropriate QA/QC samples will be collected during the sampling program:

- Ten percent of soil samples submitted for laboratory analysis (each analysis) will be submitted as duplicate (colocated) samples and analyzed for the same constituents. The duplicate soil samples will be collected at the same time as the corresponding field sample and will be obtained immediately above or below the corresponding field sample.
- One out of every 20 samples will be selected for matrix spike/matrix spike duplicate testing by the laboratory.

6.8 Others

All necessary permits and approvals identified in this Work Plan will be obtained prior to any site activities. Upon approval from the EPA, removal activities will be performed by a California-certified contractor with oversight from a California professional geologist or professional civil engineer.

7. STOCKPILE REMOVAL AND SITE RESTORATION SCOPE

Data from the investigation of the previous site assessments indicate pesticides and PCBs as contaminants of concern are present in soil. All stockpiled soil classification, transportation and disposal will be performed in accordance with all applicable federal, state, and local laws, regulations, and ordinances.

7.1 Field Documentation

The consulting contractor will be responsible for maintaining a field logbook during the sampling, excavation, backfilling, and removal activities. The field logbook will serve to document observations, personnel on-site, equipment arrival and departure times, and other vital project information.

7.1.1 Field Records

Field logbooks or daily field reports will be used to document where, when, how, and from whom any vital project information was obtained. Logbook or field report entries will be complete and accurate enough to permit reconstruction of field activities. Logbooks will be bound with consecutively numbered pages or daily field records will be collected in binders. Each page will be dated and the time of entry noted in military time. All entries will be legible, written in black ink, and signed by the individual making the entries. Language will be factual, objective, and free of personal opinions or other terminology, which might prove inappropriate. If an error is made, corrections will be made by crossing a line through the error and entering the correct information. Corrections will be dated and initialed. No entries will be obliterated or rendered unreadable.

Entries in the field logbook or daily field reports will include at a minimum the following for each fieldwork date:

- Site name and address
- Recorder’s name
- Team members and their responsibilities
- Time of site arrival/entry on site and time of site departure
- Other personnel on-site
- A summary of any on-site meetings
- Quantity of impacted soils temporarily stored on-site

- Quantity of excavated soils in truckloads transported off-site
- Names of waste transporters and proposed disposal facilities
- Copies or numbers of manifests or other shipping documents (such as bill of landing) for waste shipments
- Quantity of imported fill material in truckloads
- Deviations from this Work Plan and site HASP
- Changes in personnel and responsibilities as well as reasons for the changes
- Levels of safety protection
- Calibration readings for any equipment used and equipment model and serial number

At a minimum, the following information will be recorded during the collection of each sample:

- Sample identification number
- Sample location and description
- Site sketch showing sample location and measured distances
- Sampler's name(s)
- Date and time of sample collection
- Designation of sample as composite or grab
- Type of sample (i.e., matrix)
- Type of preservation
- Type of sampling equipment used
- Field observations and details important to analysis or integrity of samples (e.g., heavy rains, odors, colors, etc.)
- Instrument readings (e.g., photoionization detector [PID], etc.)
- Chain-of-custody form numbers
- Transport arrangements (courier delivery, laboratory pickup, etc.)
- Recipient laboratory(ies)

7.1.2 Chain-of-Custody Records

Chain-of-custody records are used to document sample collection and shipment to laboratory for analysis. All sample shipments for analyses will be accompanied by a chain-of-custody record. Form(s) will be completed and sent with the samples for each laboratory and each shipment. If multiple coolers are sent to a single laboratory on a single day, chain-of-custody form(s) will be completed and sent with the samples for each cooler. The chain-of-custody record will identify the contents of each shipment and maintain the custodial integrity of the samples. Generally, a sample is considered to be in someone's custody if it is either in someone's physical possession, in someone's view, locked up, or kept in a secured area that is restricted to authorized personnel. Until receipt by the laboratory, the custody of the samples will be the responsibility of the sample collector.

7.1.3 Photographs

Photographs will be taken of the stockpiles and locations, and other areas of interest on-site to document the operations. They will serve to verify information entered in the field logbook. When a photograph is taken, the following information will be written in the logbook or will be recorded in a separate field photography log:

- Time, date, location, and, if appropriate, weather conditions

- Description of the subject photographed
- Name of person taking the photograph

7.2 Site Preparation

Prior to equipment mobilization for the proposed operations, site preparation activities may include site inspections, surveying, boundary staking, sampling, improvement of access roads, utility connections or disconnections, and fencing and windscreen installation.

7.3 Permits and Plans

The following permits/approvals from federal, state and local agencies may be required to conduct all work:

- EPA approval of the Work Plan

This and all other necessary permits or approvals will be obtained prior to the implementation of the site activities.

7.4 Agency Communication

EPA personnel will have access to the site during excavation, backfilling, and removal of soil stockpiles. During site activities, SET will implement this communication system with the EPA to address site conditions:

- EPA shall be notified 72 hours prior to the beginning of work.
- Weekly progress reports shall be submitted to EPA from the date of approval of the Removal Work Plan until issuance of a Notice of Completion of Work or otherwise directed by the RPM.
- SET will evaluate the conditions and communicate the proposed actions with the EPA via e-mail with the RPM.
- Upon concurrence, SET project management will direct field staff to implement appropriate actions.
- Any unexpected site conditions and associated resolutions will be documented during progress reporting in the final completion report, as required.

7.5 Security Measures

Appropriate barriers and/or privacy fencing will be maintained or installed prior to the beginning of the loading of soil to ensure that all work areas are secure and safe. To ensure trespassers or unauthorized personnel are not allowed near work areas, security measures may include, but are not limited to:

- Maintaining a visitor's log. Visitors must have prior approval from the site manager to enter the site. Visitors shall not be permitted to enter the site without first receiving site-specific health and safety information from the site safety coordinator.
- Installing barrier fencing to restrict access to sensitive areas such as exclusion zones.
- Providing adequate site security to ensure unauthorized personnel have no access to work areas and/or contaminated materials.

- Before leaving the site, all personnel must sign out in the visitor's log.
- Maintaining a safe and secure work area, including areas where equipment is stored or placed, at the close of each workday.

Persons requesting site access will be required to demonstrate a valid purpose for access and if access to work areas and/or contaminated materials is planned, provide appropriate documentation to demonstrate they have received proper training required by the site-specific HSP (Appendix B).

7.6 Contaminant Control

The following measures will be implemented during soil handling activities to prevent any potential exposure of material to the adjacent properties:

- The soil stockpile handling activities will be conducted when the Work Plan is approved by the EPA.
- EPA shall be notified 72 hours prior to the beginning of work.
- SET and ECI will take necessary steps to minimize impact to the community.
- Air monitoring procedures will be implemented during loading as required.
- Adjacent tenants will be informed prior to initiation of any removal activities.
- Tenants will be notified on paper delivered to their residences. Written notices shall include work hours, approximate duration of soil handling activities and contact information for filing complaints.
- Soil stockpile removal activities will only be conducted during daylight business hours.

7.7 Air Monitoring and Dust Control Plan

7.7.1 Air Monitoring

Air monitoring is required during all soil handling activities at the site including excavation, backfilling, and soil stockpile loading. The following procedures will apply:

Excavation of soil at this site requires that South Coast Air Quality Management District (AQMD) Rule 1166 be followed. The field data sheet entitled "Dust, Odor and VOC Air Monitoring Field Data Sheet for Excavation Activities" (included in **Appendix E**) will be used during activities and includes the requirements for Rule 1166 monitoring. Air monitoring for VOCs will be conducted every 15 minutes when soil stockpiles are being worked. Air monitoring will consist of monitoring the stockpile and the site perimeter by measurement of ambient air using a photo-ionization detector (PID) calibrated to 50 parts per million (ppm) hexane to detect VOCs. Visual inspections for fugitive dust emissions and observations of odor should also be documented at this time.

Air monitoring will be performed during all stockpile handling activities in which contaminated or potentially contaminated materials will be disturbed or moved. The operations manager will staff the site with an air monitoring/health and safety professional as needed whose responsibilities will include:

- Monitoring of dust levels in the stockpile area and other locations. The site air monitoring professional will have the authority to stop work in the event that on-site activities generate dust levels greater than 5 milligrams per cubic meter (mg/m^3), which is 50 percent of the California Occupational Safety and Health Administration (Cal/OSHA) permissible exposure limit (PEL) of 10 mg/m^3. In California, PELs for chemical contaminants are provided by the Department of Industrial Relations, listed in the California Code of Regulations, Title 8, Section 5155.

- Assuring that all real-time aerosol monitors and industrial hygiene air-sampling equipment and media are properly calibrated and in good working condition. Real-time, data-logging aerosol monitors (personal DataRAM) will be used, when required, to measure dust levels. Real-time information will be posted daily, and discussed with site workers.
- Coordination of general site safety activities, including all daily hazard communication, safety practices and procedure briefings.
- Oversight of personal decontamination practices, and
- General site safety leadership, support and recordkeeping activities.

7.7.2 Dust Control

Fugitive dust control measures will be implemented at the site to mitigate off-site dust migration to neighboring properties and affecting on-site workers. This section details potential dust control measures that the contractor will implement to minimize dust emissions during the removal action. Dust emissions may result from activities during removal action and from wind erosion. These sources are most effectively controlled using wet suppression. A high wind threshold will also be established to minimize wind erosion during extreme meteorological conditions and low visibility/permeability wind fencing will be installed around the area. Stockpiles will be covered unless being loaded, water will be sprayed on areas which have already been excavated and are subject to wind erosion. Additionally, SET will monitor dust levels and airborne concentrations of the VOCs in the following general locations:

- Upwind;
- Proximate to the stockpile area;
- Up to three fence line/downwind locations; and
- As deemed necessary to determine worker exposure (to be determined by the contractor).
- Real-time, data-logging aerosol monitors (i.e., personal DataRAM or PDM-3 Mini Ram particulate monitor manufactured by MIE) will be used to measure airborne dust levels during the work hours at the site. At a minimum, the PDM-3 MiniRAM or an equivalent dust meter will be placed upwind to monitor background dust levels, a second dust meter will be placed on the equipment (i.e., backhoe) to provide worst-case dust concentrations at the site, and one dust meter will be placed downwind to monitor dust levels leaving the site. Locations of the upwind and downwind dust meters will be determined at the beginning of each day, based on the wind conditions. Locations will be reviewed during the activities and locations adjusted depending on wind conditions. Excavation activities will be temporarily halted and dust masks will be provided to site workers in the event particulate concentrations exceed the action level of 5 mg/m^3. Dust meters will be calibrated daily. Dust monitoring results will be posted daily and discussed with site workers. The dust meters will be set to log dust levels over five-minute periods and will be visually read every 15 minutes.
- The South Coast AQMD limit for nuisance dust is 50 micrograms per cubic meter ($\mu g/m^3$) greater than the corresponding upwind dust level. Therefore, the action level for off-site dust

monitoring activities will be 50 µg/m³ greater than corresponding upwind levels. In the event that on-site activities generate dust concentrations in excess of the established action levels, activities will cease until dust concentrations are below the action levels.

Exposure guidelines for the site COCs are summarized in the table below.

Exposure Guidelines for Site Chemical Hazards

Chemical Name	***Odor Threshold***	***CAL/OSHA PEL*** [a]	***ACGIH TLV*** [b]	***Site Action Levels*** [c]	***Community Action Level (Fence Line)*** [d]
Total Dust	*Not Listed*	*10 mg/m³*	*10 mg/m³*	*5 mg/m³*	*0.05 mg/m³*
Chlordane	*Not Listed*	*0.5 mg/m³*	*0.5 mg/m³*	*500 µg/m³*	*N/A*
4-4-DDD	*Not Listed*	*1.0 mg/m³*	*1.0 mg/m³*	*1.0 mg/m³*	*N/A*
4-4-DDE	*Not Listed*	*1.0 mg/m³*	*1.0 mg/m³*	*1.0 mg/m³*	*N/A*
4-4-DDT	*Not Listed*	*1.0 mg/m³*	*1.0 mg/m³*	*1.0 mg/m³*	*N/A*
Dieldrin	*Not Listed*	*0.25 mg/m³*	*0.25 mg/m³*	*250 µg/m³*	*N/A*
Toxaphene	*Not Listed*	*0.5 mg/m³*	*0.5 mg/m³*	*500 µg/m³*	*N/A*
Benzo(b)fluoranthene	*Not Listed*	*0.2 mg/m³*	*0.2 mg/m³*	*200 µg/m³*	*N/A*

Notes:
a Permissible Exposure Limits (Cal/OSHA Article 107, Table AC1)
b 1990-1991 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists
c Site action level is calculated as 10% of threshold limit value or PEL (as measured by NIOSH methods), whichever is lower. If an action level is met or exceeded, then additional dust mitigation measures will be implemented. If the site air contaminants cannot be controlled reliably within 15 minutes, all work will cease and a certified industrial hygienist will be consulted. If site action level for lead is exceeded on the integrated air monitors, a certified industrial hygienist will be immediately consulted.
Site action levels for unknown volatile organic compounds (VOCs) as measured by real-time photo-ionization detector = 1 ppm
d Community action level for total dust/particulate is based on AQMD regulations.
mg/m3 — milligrams per cubic meter
µg/m3 — micrograms per cubic meter
N/A — Not available

7.7.2.1 Wet Suppression

The main mechanism for the control of fugitive dust emissions from construction activities and wind erosion is by watering, which leads to the formation of a surface crust to reduce the available reservoir of dust. In addition to water, a wide variety of chemical dust suppressants are available to enhance the formation of a surface crust. The effectiveness of wet suppression is dependent on the type of activities occurring, the frequency of watering, and the meteorological conditions. Watering of the active stockpile area will be conducted throughout the operations as needed. The watering schedule will be determined by an evaluation of the air monitoring and meteorological data, site conditions, and site activities. Wet suppression for this site consists of the following:

- Minimizing dust generation activities and methods used during stockpile management;
- Using a water truck equipped with valved hoses that will refill at a local fire hydrant equipped with a permitted temporary water meter;

- Manual spraying of soil stockpiles to reduce dust when the stockpiles are being worked and are not covered; and
- Ensuring that soil is removed from all vehicles leaving this site using brushes and water spray, as required.

Note that water should be used sparingly so that discharge of dust-suppression water from this site is prevented and soil transported off-site for disposal is not saturated.

7.7.2.2 Meteorological Monitoring

On-site ambient weather conditions (wind speed and direction, and relative humidity) will be monitored by the following methods: an on-site met station, real-time internet weather locations, or the National Weather Service (if a local station can provide data relevant to the site). If off-site meteorological stations cannot provide data relevant to the site, an on-site meteorological station will be set up and monitored during activities.

On-site meteorological monitoring will be performed simultaneously with the activities to ensure all necessary precautions have been taken.

7.7.2.3 High Wind Warnings

High wind conditions can lead to higher dust emissions. Thus, based on the information collected by the on-site meteorological station, work will be stopped during high wind conditions. There are no wind speed restrictions stated in local or federal regulations.

However, an initial self-imposed action level for work stoppage will be set at a sustained wind speed of 25 mph for a 15-minute duration. This action level is subject to revision based on actual site conditions.

7.7.2.4 Wind Fences

Wind fences will be used as a dust control measure in conjunction with other dust control measures discussed above. The fence reduces the wind speed at a specific location. The fence dimensions necessary to achieve optimum effectiveness will vary depending on the geography of the dust source. Typically, a fence material with 50 percent porosity is generally considered optimum for most applications. Low visibility/permeability windscreens will be installed around the perimeters of the area during the removal activities.

7.8 Storm-Water Management Procedures

A storm-water NPDES General Permit may be required for construction at this site because it is in excess of 1 acre in area. Additionally, ECI's Storm Water Pollution Prevention Plan (SWPPP) and commonly accepted best management practices (BMPs) will be followed if a storm event occurs during the stockpile management phase of this project. The following BMPs will be implemented if a storm event starts or is imminent. Note that the primary intent of the BMPs described below is to prevent storm water from eroding stockpiles and open excavations, which could result in sediment or contamination in soil being discharged with storm water to the storm drain. The following BMPs will be implemented as needed:

- Place sandbags or equivalent around edges of the base sheet under stockpiles to prevent surface flow over or through the stockpiles.
- Cover all stockpiles and open excavations with 10-mil-thick polyethylene sheeting, using sandbags to secure the edges and taking care to ensure that all storm water will flow off the sheeting and not collect in the sheeting beneath the stockpiles.
- Place straw bale barrier, gravel bag barrier, or fiber rolls around the stockpiles, excavations, and storm drain culverts to contain sediment and divert storm-water surface flow.

Additional requirements may be necessary and will be detailed in the NPDES permit documents.

7.9 Soil Excavation of Additional Areas

Excavation of 12 additional areas is required in order to achieve the health risk criteria identified in Section 2.1 under future residential exposure scenarios as shown in **Figures 8 and 9**, including 7 areas within the planned residential lots and 5 areas within the proposed deed restricted area. The 7 areas within planned residential lots include Borings B24, B32, P-01, P-19, P-25, P-26, and P-31. Soils at these 7 locations contain PCBs, TPHg, or benzo(b)fluoranthene at concentrations exceeding their respective health risk criteria as follows:

<u>PCBs >0.089 mg/kg</u>

- P-01: 0.23 mg/kg at 5 to 8 feet bgs
- P-19: 0.10 mg/kg at 16 to 20 feet bgs
- P-25: 1.3 to 3.0 mg/kg at 8 to 20 feet bgs
- P-26: 2.9 mg/kg at 8 to 12 feet bgs
- P-31: 0.14 mg/kg at 16 to 20 feet bgs

<u>TPHg >500 mg/kg</u>

- B24: 510 mg/kg at 2 feet bgs

<u>Benzo(b)fluoranthene >0.16 mg/kg</u>

- B32: 0.49 mg/kg at 2 feet bgs

The PCB-impacted borings have not yet been excavated and are located along the western extent of the historical stormwater pathway. Borings B24 and B32 are located west of the historical stormwater pathway in the southwestern and central portions of the property. None of the soil investigation borings located within the residential lots contain total DDT in excess of the health risk criterion of 10 mg/kg. Unimpacted overburden will be segregated during excavation of these areas and stockpiled separately for potential re-use at the site as backfill, pending soil stockpile characterization sample results.

The 5 areas within the deed restricted area include Borings P-09, P-32, P-35, P-36, and P-47. Soils at these 5 locations contain total DDT or PCBs exceeding their respective health risk criteria within the upper 5 feet as follows:

Total DDT >10 mg/kg and <5 feet bgs

- P-32: 25 mg/kg at 2 to 5 feet bgs
- P-36: 13 mg/kg at 2 to 5 feet bgs
- P-47: 13 mg/kg at 0.5 to 2 feet bgs

PCBs >0.089 mg/kg and <5 feet bgs

- P-09: 0.21 mg/kg at 2 to 5 feet bgs
- P-35: 0.51 mg/kg at 0.5 to 2 feet bgs

These soil borings have not yet been excavated and are located either west or south of the existing excavation extent. The only other location at the property where total DDT exceeded 10 mg/kg in the upper 5 feet was at Boring P-37, and this location was previously excavated in 2015. Similarly, all other pesticide COCs exceeding their respective residential health risk criteria between 0 and 5 feet bgs (e.g., chlordane, dieldrin, and heptachlor) were previously excavated in 2015. The estimated volumes of soil to be excavated at these 12 areas are summarized as follows:

Within Planned Residential Lots

- PCB-impacted soils = 850 cubic yards
- TPHg-impacted soils = 100 cubic yards
- Benzo(b)fluoranthene-impacted soils = 200 cubic yards
- Unimpacted overburden = 2,150 cubic yards
- Subtotal = 3,300 cubic yards

Within Proposed Deed Restricted Area

- PCB-impacted soils = 150 cubic yards
- Total DDT-impacted soils = 300 cubic yards
- Unimpacted overburden = 250 cubic yards
- Subtotal = 700 cubic yards

Sidewall samples will be collected from all excavation sidewalls to confirm that the respective residential goals for the COCs were achieved. If a sidewall sample is found to contain more than the residential goal, additional soil will be excavated until the residential goal is achieved at these locations. Since all of the soil in the upper 5 feet surrounding Borings P-09, P-32, and P-36 will be excavated, an excavation bottom sample will not be collected at these locations. However, an excavation bottom sample will be collected at all other excavation areas. The soil excavated at these locations will be stockpiled separately from the existing soil stockpiles at the Site pending either backfilling at depths greater than 5 feet bgs under the eastern roadway or transportation for off-site disposal.

7.10 Backfill and Site Restoration

The estimated 2,400 cubic yards of segregated clean overburden will be stockpiled separately from the COC-impacted soil, sprayed with water to suppress dust, and covered with plastic sheeting. Composite sampling of the stockpiled clean overburden will be conducted as described in Section 7.12 to confirm that this material contains COCs below the residential health risk criteria. Stockpiled soil with COCs below the residential health risk criteria will be used to backfill the upper 5 feet of the existing excavation and the additional excavation areas under current or projected future surface elevations. An off-site source of clean backfill material will be identified prior to the remedial action and appropriately tested, including for pesticides, as indicated in Section 7.10.1 below. Clean backfill material will be imported as needed to backfill the excavated areas and restore the site for residential use. As stipulated in the April 28, 2016 EPA comment letter, none of the existing soil stockpiles will be backfilled at the site. All of the soil currently stockpiled at the site will be transported for off-site disposal as a non-RCRA California hazardous waste.

7.10.1 Borrow Source Evaluation

To the extent required, off-site soil sources will be evaluated to ensure that material is free of contamination including pesticides and other COCs (e.g., some soil sources can contain elevated background levels of pesticides and metals). Evaluation of the import soils for presence of contaminants must be concluded prior to their consideration for use as replacement fill at the site. Documentation and sampling may be used to verify that the material is free of contamination.

7.10.2 Load Checking

All loads of imported fill will be checked by a PID for each truckload entering the site and by visual screening for fuel/hydraulic oil leaks (or other staining) in soil placed for filling the site excavation. Although this field check will not detect pesticides, SVOCs, or metals in soils, it will detect VOCs and hydrocarbon staining of soils.

7.10.3 Diversion of Unacceptable Borrow

If contaminated soil (exhibiting discoloration or detectable VOCs) in imported loads are found or suspected, the imported fill soil will be isolated. The transporter of the prohibited materials will be identified, and the contractor will be contacted to determine what appropriate actions will be taken. Segregated, improper materials will be removed from the site immediately. These materials will be reloaded to the transporter’s vehicle and transported back to the source facility.

7.10.4 Documentation of Rejected Loads

All loads, which enter the site and are subsequently rejected, will be recorded. Data compiled will include when the incident occurred, who the hauler was, why the load was rejected, whether the load was dumped prior to rejection, and what steps were taken to remove the rejected material. Additional data may be recorded as deemed necessary for the particular situation.

A separate area will always be maintained for the storage of unacceptable materials, pending removal by the original transporter or a properly licensed waste hauler. A temporary pad will be constructed for temporary storage of unacceptable soils segregated from dumped loads. The pad will be used to store these segregated materials solely for the length of time required to enlist the services of a licensed waste hauler for their removal.

7.11 Soil Loading and Removal Procedures

All fieldwork will be completed by properly trained and equipped hazardous waste workers. Impacted soil will be loaded onto transportation trucks. During loading efforts will be made to minimize the soil drop height from the loader's bucket into the transport trucks. Dust control and air quality monitoring activities will be conducted as described in previous sections of this Work Plan. All work will be supervised by an SET Civil Engineer or a PG registered in the State of California.

After loading, the trucks will be checked to see if the manifests are completed correctly. The loaded trucks will then be prepared for off-site transportation as detailed in **Appendix D**. A traffic control plan meeting requirements of the County of Los Angeles, Caltrans and the City of Torrance will be implemented during the activities.

Note that before soil loading activities are started (and on a daily basis during these activities), weather information will be obtained by the project manager, concerning the probability and severity of a storm event occurring during the scheduled field activities. Activities may be postponed based on the predicted weather. For example, if a prolonged storm event resulting in rain in excess of 0.1 inch is predicted, storm-water management plans will be implemented and site activities may be postponed. However, a light rain event may not require work to stop, but storm-water management plans should be put in place. Weather forecasts can be obtained by calling the Western Regional Climate Center or via the Internet at.

Dust control and air monitoring for dust, odor, and VOC emissions will be conducted during all activities resulting in generation of dust, and in compliance with AQMD Rule 1166. The dust control plan and air monitoring plan are described in Sections 8.2 and 8.3 of this RAP. A field data sheet compliant with Rule 1166 for documentation of the air monitoring efforts is included in Appendix E. Note that a notification regarding use of the Various Locations Rule 1166 Contaminated Soil Mitigation Plan must be sent to the AQMD 24 hours before the activities begin.

7.11.1 Soil Management Procedures

Conventionally accepted soil management procedures will prevent fugitive dust emissions during stockpile management, reduce volatilization of VOCs to the air from impacted soil, and contain site soil, silt, and other sediment material sourced from the activities. Refer to the site specific Soil Stockpile Management Plan for details on managing the four soil stockpiles.

Stormwater will be managed in accordance with the SWPPP by ECI. The stockpile area will be surrounded by a secondary containment perimeter barrier, berm or dike to preclude storm water runoff from the stockpiles to surrounding areas of the project site.

7.12 Sampling and Analysis Plan

7.12.1 Field Sampling Plan

SET proposes to collect composite soil samples from the stockpiled soil for profiling the waste at approximately 1 to 2 feet below the surface of the stockpile following EPA SW-846 protocol. The samples will be collected in glass jars that will be sealed immediately with Teflon-lined caps. Each sample container will be labeled with the sample identification number and sampling depth. The samples will then be stored on ice in a portable cooler maintained below 4 degrees Celsius and transported to a state-certified laboratory. The samples will be recorded on a chain-of-custody record identifying the sampler, date, time, couriers used, responsible laboratory personnel, and requested analyses. SET will deliver the samples to a state-certified laboratory within 24 hours of collection. The following sampling frequencies will apply to the total soil volume for each of the preliminary waste classifications. Total stockpiled soil volume may include multiple individual stockpiles.

Four representative 4-point field samples will be collected from the stockpiled soil and these four samples will be composited by the laboratory prior to analysis   One 4-point composite sample will be collected for each 250 cubic yards of soil. Based upon this protocol, this estimated number of stockpile profiling will be as follows:

- Stockpile #1:   Volume estimated at 740 cubic yards; one 4-point composite sample per 250 cubic yards yields an estimated total of three 4-point composite samples.
- Stockpile #2:   Volume estimated at 2,500 cubic yards; one 4-point composite sample per 250 cubic yards yields an estimated total of ten 4-point composite samples.
- Stockpile #3:   Volume estimated at 2,133 cubic yards; one 4-point composite sample per 250 cubic yards yields an estimated total of nine 4-point composite samples.
- Stockpile #4:   Volume estimated at 2,475 cubic yards; one 4-point composite sample per 250 cubic yards yields an estimated total of ten 4-point composite samples.

SET collected 32 composite samples from four onsite stockpiles on January 15 and 18, 2016 with lab data attached as **Table 1**.   As shown in Table 1, only 3 of 32 composite samples (SP1-ECI-2, SP1-ECI-3, and SP4-ECI-2) contained total DDT less than 10 mg/kg. The remaining composite sample from Stockpile #1 (SP1-ECI-1) and the 28 composite samples from Stockpiles #2 through #4 contained total DDT between 12 and 771 mg/kg. However, in accordance with the April 28, 2016 EPA comment letter, all of the soil currently stockpiled at the site will be transported for off-site disposal as non-RCRA California hazardous waste. Future soil stockpiles will be sampled in accordance with the methods specified in this section, and all work will be performed in accordance with the site HSP (Appendix B).

7.12.2 Laboratory Analysis

SET's soil sampling and handling procedures will be in accordance with USEPA's *Test Methods for Evaluating Solid Waste – Physical/Chemical Methods* (SW-846; Revision 6). Soil samples will be transferred to laboratory-quality sample containers and preserved by SET in accordance with SW-846. Each soil sample will be recorded and transported using an approved chain-of-custody form.

SET will request laboratory turn-around time sufficient to meet its contractual schedule; however the maximum turn-around time will be seven calendar days.

Soil samples will be analyzed in accordance with standard EPA protocols and the QAPP for one or more of the following:

- Total petroleum hydrocarbons (full carbon chain) by EPA Method 8015;
- Volatile organic compounds (VOCs) by EPA Method 8260B;
- Semi-volatile organic compounds (SVOCs) by EPA Method 8270C;
- Polychlorinated biphenyls by EPA Method 8082;
- Organochlorine pesticides by EPA Method 8081A; and
- California Code of Regulations Title 22, California Assessment Manual (CAM) metals by EPA Method 6010B/7470A

7.13 Transportation Plan for Off-site Disposal

The stockpiled soil will be profiled and approval will be received before soil is transported off-site for lawful disposition. Based on the previous site investigation, the soil excavated from the site will be handled, transported and disposed of as non U-listed waste unless otherwise directed or approved by the EPA. In accordance with the April 28, 2016 EPA comment letter, all of the stockpiled soil currently at the site will be transported for disposal as a non-RCRA California hazardous waste. Pending laboratory results of future soil stockpile characterization samples, the anticipated soil volumes to be transported for off-site disposal are summarized as follows:

- Current soil stockpiles = 7,848 cubic yards
- Future soil stockpiles
  - PCB-impacted = 1,000 cubic yards
  - Total DDT-impacted = 300 cubic yards
  - TPHg-impacted = 100 cubic yards
  - <u>Benzo(b)fluoranthene-impacted = 200 cubic yards</u>
- Subtotal = 9,448 cubic yards

Final determination of the facility identified for disposal will be based on approval from the facility and EPA Region 9. Once the disposal facility is confirmed, copies of waste profile reports used to secure disposal permission from the facility will be provided to the EPA. In addition, compliance with the land disposal restrictions and land ban requirements for hazardous wastes will be documented and provided to the EPA in the event a portion of the soil needs to be designated as hazardous waste.

All vehicles will be decontaminated prior to leaving the work area. For track-out prevention and control, all trucks will be dry brushed after loading to remove loose soil. The dump truck or roll-off bin portion of the truck will then be covered with a tarp to prevent soil and/or dust from spilling out of the truck during transport to the disposal facility.

Prior to leaving the load-out area, each truck will be inspected by the contractor to ensure that the payloads are adequately covered, the trucks are cleaned of spilled soil, and the shipment is properly manifested. Proper hazardous waste placarding may be required for transportation of hazardous wastes. Soil being transported off-site will be taken to the approved facility under State, Federal and local regulations.

Detailed information on waste transportation and disposal is described in the Transportation Plan included in Appendix D.

All vehicles will be decontaminated prior to leaving the work area. For track-out prevention and control, all trucks will be dry brushed after loading to remove loose soil. The dump truck or roll-off bin portion of the truck will then be covered with a tarp to prevent soil and/or dust from spilling out of the truck during transport to the recycling facility.

Prior to leaving the load-out area, each truck will be inspected by the SET field staff to ensure that the payloads are adequately covered, the trucks are cleaned of spilled soil, and the shipment is properly manifested.

7.14 Manifests

The waste manifest form (e.g., Uniform Hazardous Waste Manifest) will be used to track the movement of soil from the point of generation to the point of ultimate disposition. The waste manifests will include information such as:

- Name and address of the generator, transporter, and the destination facility
- Description of the waste being transported and any associated hazards
- Waste quantity and waste classification codes
- Name and phone number of a contact in case of an emergency
- Other information required either by the disposal facility or EPA

Before transport of the excavated soil off-site, an authorized representative of ECI will sign each waste manifest. The removal action contractor’s site manager will maintain one copy of the waste manifest on-site.

7.15 Traffic Control and Loading Procedures

It is anticipated that the trucks will enter the site from Normandie Avenue. Traffic control and a flag person will be located at the site to assist the truck drivers to safely drive onto the site. A truck staging area may be designated at the site. While on the property, all vehicles will be required to maintain slow speeds (i.e., less than 5 mph) for safety purposes and for dust control measures. The soil will be loaded from the stockpile areas into the end-dump trucks. While the soil is being loaded into the trucks, dust suppression will be performed by lightly spraying or misting the work areas with water. Efforts will be made to minimize the soil drop height from loader’s bucket into the transport trucks. After the soil is loaded into the transport trucks, the soil will be covered and otherwise contained to prevent soil from blowing or spilling out of the truck during transport to the disposal facility. The trucking subcontractor will be required to provide trucks that do not allow soil to be spilled or blown out from the bottom, sides or tops of the trucks.

It is estimated that up to 50 trucks per day could be loaded during the removal activities, however 15 to 20 are anticipated for the current disposal of stockpiled soil to the South Yuma Landfill, and sent to the selected facility for lawful disposal under ECI EPA # CAL000278605. Prior to and during removal activities, the operations contractor will coordinate with the designated disposal facility regarding the daily number of truckloads to be sent to the facility. The trucks will exit the site toward the west onto Normandie Avenue. As the trucks leave, the flag person will assist the truck drivers so that they can safely merge into traffic. Prior to exiting, the truck drivers will be required to brush their tires clean and remove any overburdened soil from areas of their truck that is not covered or protected. This cleanup/decontamination area with tarping will be set up as close to the loading area as possible so as to minimize spreading the impacted soil. Before trucks leave the site, the removal action contractor’s site manager will be responsible for inspecting each truck to ensure that the payloads are adequately covered, the trucks are cleaned of overburdened soil, and the soil is properly manifested. The anticipated routes of truck ingress and egress and truck staging area will be selected by SET prior to transport.

7.16 Variance

As conditions in the field may vary, it may become necessary to implement minor modifications to soil sampling and stockpile removal activities as presented in this Work Plan. Field personnel will notify the project manager when deviations from this Work Plan are necessary. ECI and EPA as necessary will be notified of the modification immediately, and a verbal or written approval will be obtained from before the modifications are implemented, as appropriate. Modifications to the approved Work Plan will be documented in the field logbook.

7.17 Project Schedule and Summary Report

7.17.1 Project Schedule

The scope of work shall be completed according to the following schedule, from the date that authorization to proceed has been received from EPA (time to complete each task):

1. Pre-field activities (including disposal site selection/profiling)	1 week
2. Soil loading and off-site transportation	4-6 weeks
3. Stockpile Disposal Summary Report	7-8 weeks

Some of the above tasks can be conducted concurrently, and therefore, SET estimates that the entire project can be completed, including submittal of the report, in 8 to 13 weeks after EPA approval of this Work Plan is received. This schedule is based on the assumption that access is readily available. The schedule is also based on the assumption that no significant modifications to this Work Plan are necessary.

7.17.2 Progress Reporting

Progress reporting will be provided to the EPA RPM reporting on specific actions performed during the process of removing the stockpiled soil. The progress reporting will continue until completion of site activities.

7.17.3 Removal Action Final Report

Following completion of the stockpile backfilling and removal action, a summary report will be prepared in accordance with standard EPA protocols and submitted to the EPA for review and approval. The report will include a summary of the soil management and removal activities, field logs, air monitoring results, dust control measurements, waste disposal manifests, and site restoration procedures. The report will be prepared and certified by a PG. The report will include the following:

- Site description and background;
- Description of field procedures;
- Discussion of soil stockpile sampling results;
- Tabulated summary of laboratory analytical results;
- Site vicinity map;

- Site plan with sample locations and soil stockpiles area;
- Comparison of laboratory results with regulatory screening levels;
- Copies of waste manifests and weight tickets;
- Air monitoring data;
- Photographs;
- Conclusions; and
- Recommendations.

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15. Sharp Environmental Technologies, Inc., *Technical Memorandum – Supplemental Site Investigation, 2. Revision*, May 19, 2015.

16. Sharp Environmental Technologies, Inc., *Removal Action Work Plan (RAW)*, June 18, 2015.

17. Sharp Environmental Technologies, Inc. *Soil Stockpile Removal and Site Restoration Work Plan,* Ecology Control Industries, 20846 Normandie Avenue, Torrance, CA 90502, February 11, 2016.

18. Sharp Environmental Technologies, Inc. *Revised Soil Stockpile Removal and Site Restoration Work Plan, Version 2.0*, Ecology Control Industries, 20846 Normandie Avenue, Torrance, CA 90502, March 29, 2016.

19. USEPA Region 9, *Final Remedial Investigation Report for the Montrose Superfund Site, Los Angeles, California*, May 18, 1998.

20. USEPA Region 9, *Action Memorandum, Request for Removal Action for Kenwood Storm Water Drainage Pathway*, June 8, 2001. http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/3dc283e6c5d6056f88257426007417a2/64e11a6ece4d1e4888257007006a249f!OpenDocument

21. USEPA, Guidance on Systematic Planning Using the Data Quality Objectives Process- EPA QA/G-4, Office of Environmental Information, Washington, DC, February 2006, http://www.epa.gov/sites/production/files/documents/guidance_systematic_planning_dqo_process.pdf

22. USEPA Region 9, *Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites,* 2015, http://www.epa.gov/region9/superfund/prg/.

23. USEPA, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846,* Office of Solid Waste and Emergency Response, Washington, DC, 2007, http://www.epa.gov/waste/hazard/testmethods/sw846/online/index.htm.

24. USEPA Region 9, Letter to Mr. Ronald J. Flury, Ecology Control Industries, Inc. and to Mr. Joseph C. Kelly, Montrose Chemical Corporation of California, Soil Stockpiles at Ecology Control Industries, 20846 Normandie Avenue, Torrance, CA 90502, December 14, 2015.

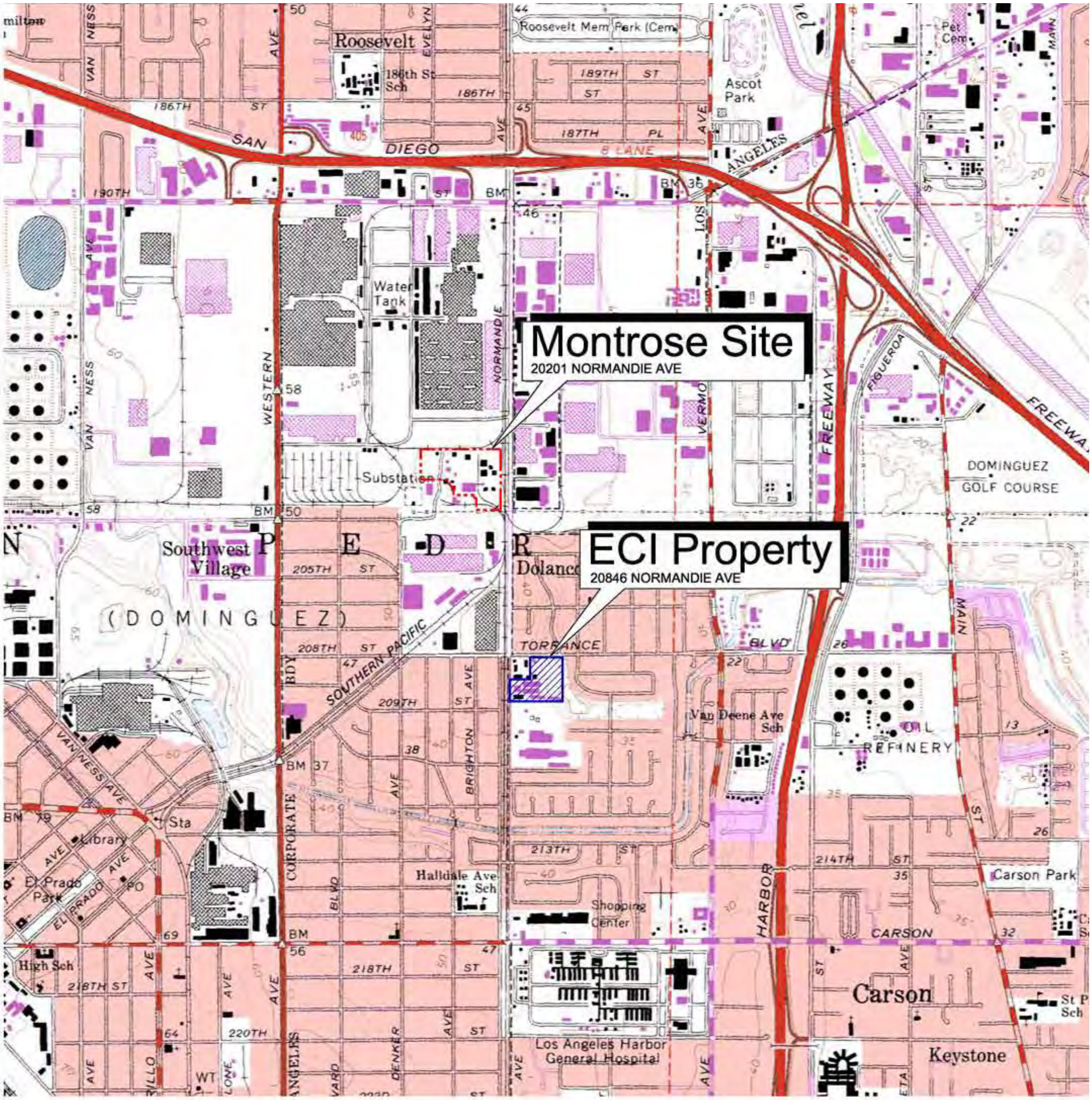
25. USEPA Region 9, Letter to Mr. Ronald J. Flury, Ecology Control Industries, Inc. and to Mr. Joseph C. Kelly, Montrose Chemical Corporation of California, Modification of CERCLA Unilateral

Administrative Order to Conduct Removal Activities, U.S. EPA Region 9 CERCLA Docket No. 2016-01, March 9, 2016.

26. USEPA Region 9, Letter to Mr. Ronald J. Flury, Ecology Control Industries, Inc. and to Mr. Jeffrey Sharp, PG, Sharp Environmental Technologies, Inc., Comments on Revised Soil Stockpile Removal and Site Restoration Work Plan Version 2.0, submitted by Ecology Control Industries, Inc. on March 29, 2016; April 28, 2016.

FIGURES

Figures 1 through 10



NORTH

0 1,000 2,000 FEET

SCALE: 1"= 2,000'

Reference:

1. U.S.G.S. Topographic Map, Torrance, California 7.5 Minute Quadrangle. Georeferenced using the State of California's CASIL On-line GIS Database, Copyright 2006.

Source: Soil Investigation Report, Historic Stormwater Pathway, Earth Tech, Inc. 2008

Sharp Environmental Technologies, Inc.

839 S. Beacon Street, #1967, San Pedro, California 90733 Tel (310) 505-3675 Fax (310) 548-3935

Historical Stormwater Pathway - South Montrose Chemical Superfund Site

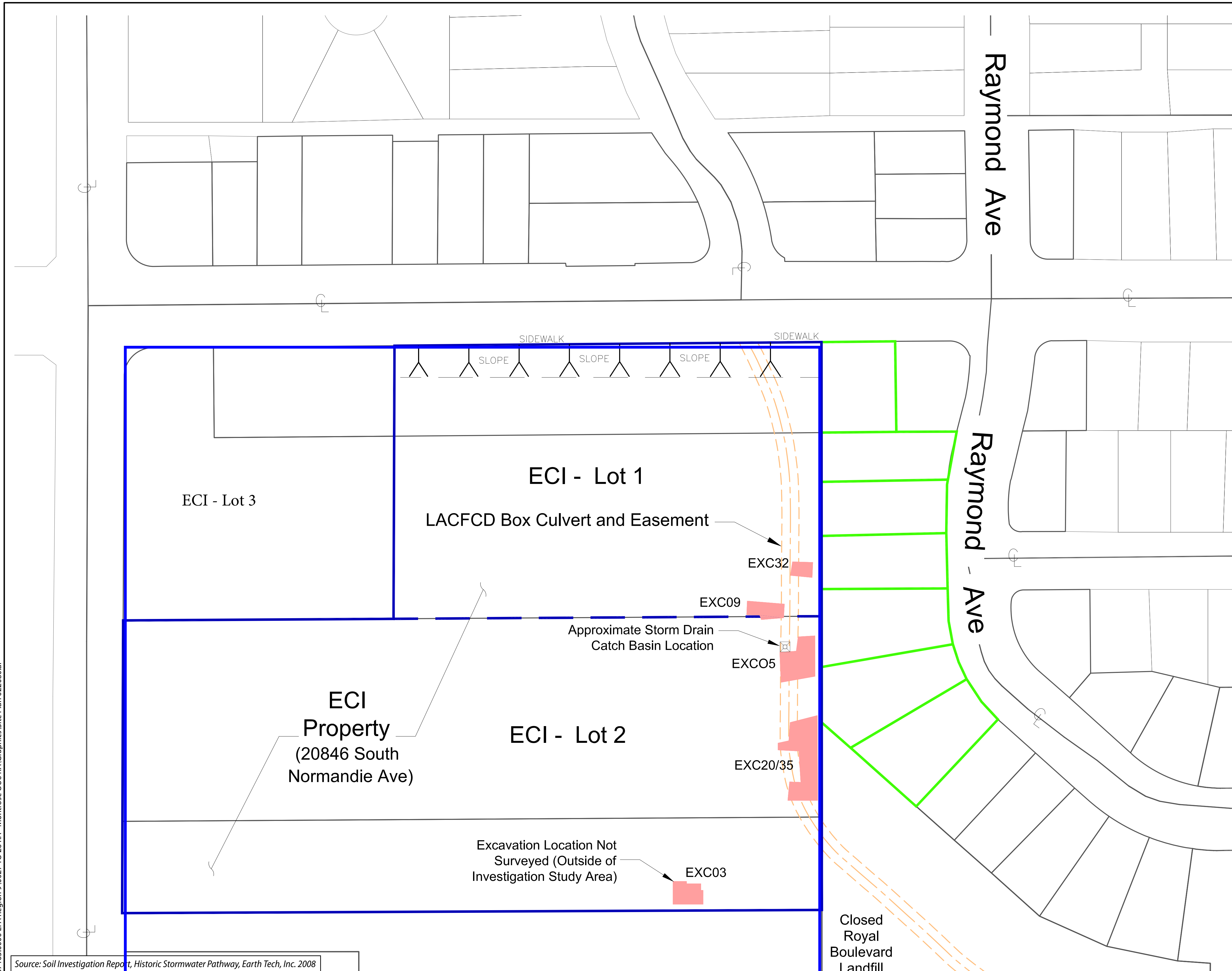
U.S. EPA Region 9

Los Angeles County, California

FIGURE 1

Site Location

\\engineering\PROJECTS\07163.000 EPA Region 9\0027 TO 26 RA - Montrose OU6 RA\Graphics\Site Location 1107.ai

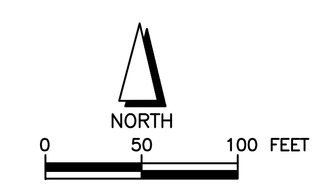


Explanation:

- ECI Property Boundary
- ECI Lot Subdivision Line
- Existing Excavation Pit (EXC03)
- LACFCD Box Culvert and Easement
- EPA Residential Investigation Area
- Soil and Soil-gas Investigation Area
- Proposed Soil/Soil-gas Sample

References:

1. Parcel Boundaries, Los Angeles County Assessors Office, Los Angeles City Department of Public Works On-line GIS Parcel Database, Copyright 2006.
2. Source of Flood Control / Storm Water Channel: Los Angeles Flood Control District Map, revision date May 6, 1970, Sheet No. 428-RW3.1.
3. Dulin and Boynton 2006, for locations of Eastern Excavations Only.



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Historical Stormwater Pathway - South
Montrose Chemical Superfund Site
U.S. EPA Region 9
Los Angeles County, California

FIGURE 2
Site Plan

Explanation:

Current ECI Property Boundary

Unimproved Slough on Current ECI Property

EPA Estimated Extent of the Historical Stormwater Pathway

Source: Soil Investigation Report, Historic Storm Water Pathway, Earth Tech, Inc., 2008

NORTH

0 150 300 FEET

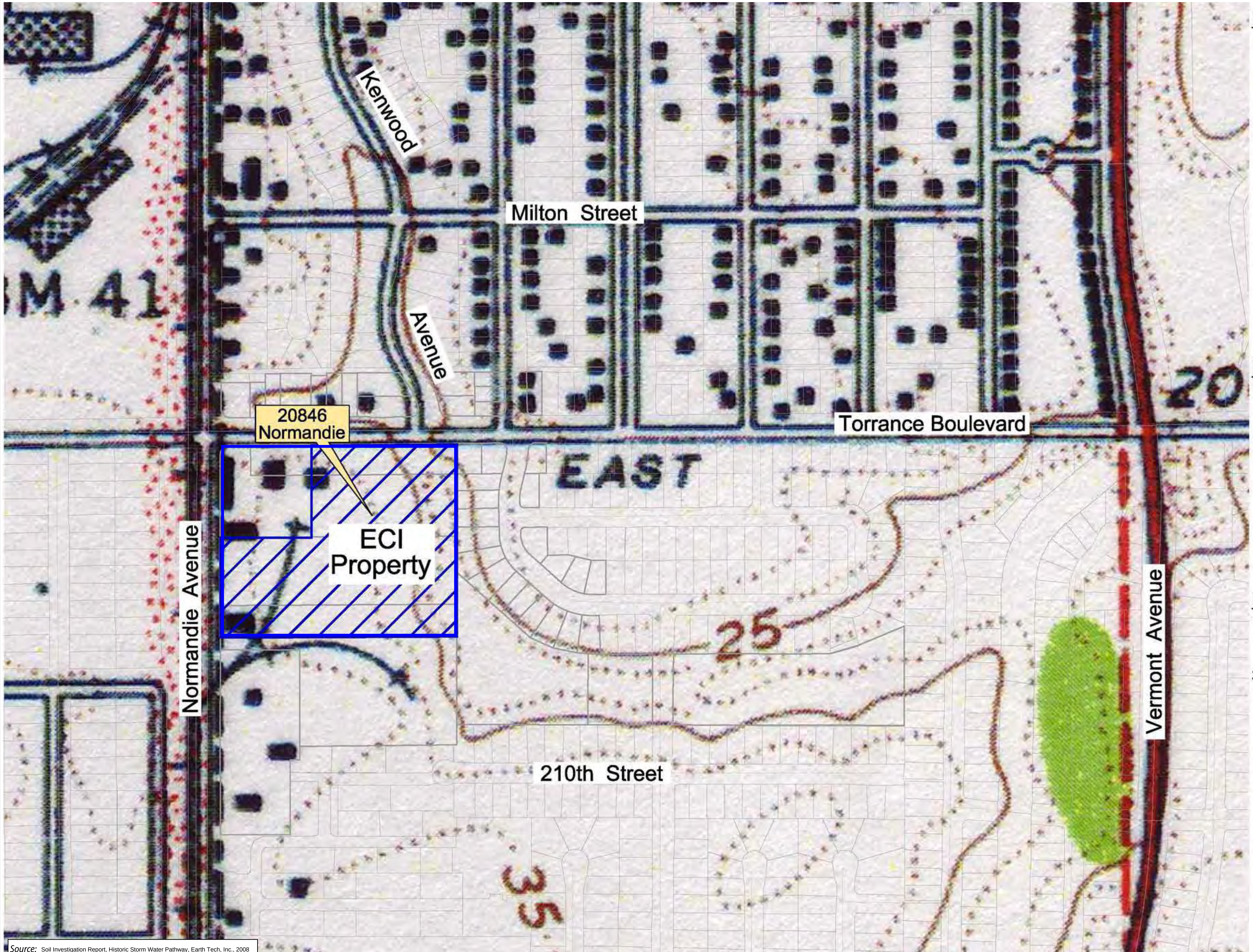
SCALE: 1"= 300'

Reference:

1. Aerial Photo dated 1947, from Fairchild.

Montrose Chemical Corporation		Revised 02/28/08
1947 Aerial Photograph of ECI Property and Historic Storm Water Pathway Historical Stormwater Pathway		
Date: 02-08	ECI Property	Figure 3
Project No. 99700	Sharp Environmental Technologies, Inc. 839 S. Beacon Street, #1967, San Pedro, California 90733 Tel (310) 505-3675 Fax (310) 548-3935	

Z:\et\montrose\torrance\litigation\2008\sitemaps.0208\99700 Fig 3 Montrose ECI FSP.1947 Historical.Image.022808.dwg



Explanation:

25 Surface Elevation (Feet Above Mean Sea Level) from U.S.G.S. Topographic Map

Note:

1. Properties shown were identified by EPA in Letter dated September 12, 2005.

Reference:

1. Los Angeles County Assessors Office, Los Angeles City Department of Public Works On-line GIS Parcel Database, Copyright 2005.
2. U.S.G.S. 7.5 Minute Topographic Quadrangle Map, Torrance, California dated 1951.

NORTH
0 150 300 FEET
SCALE: 1"= 300'

\\engineering\PROJECTS\07163.0000 EPA Region 9\0027 TO 26 RA - Montrose OU6 RA\Graphics\Topo 022080.ai

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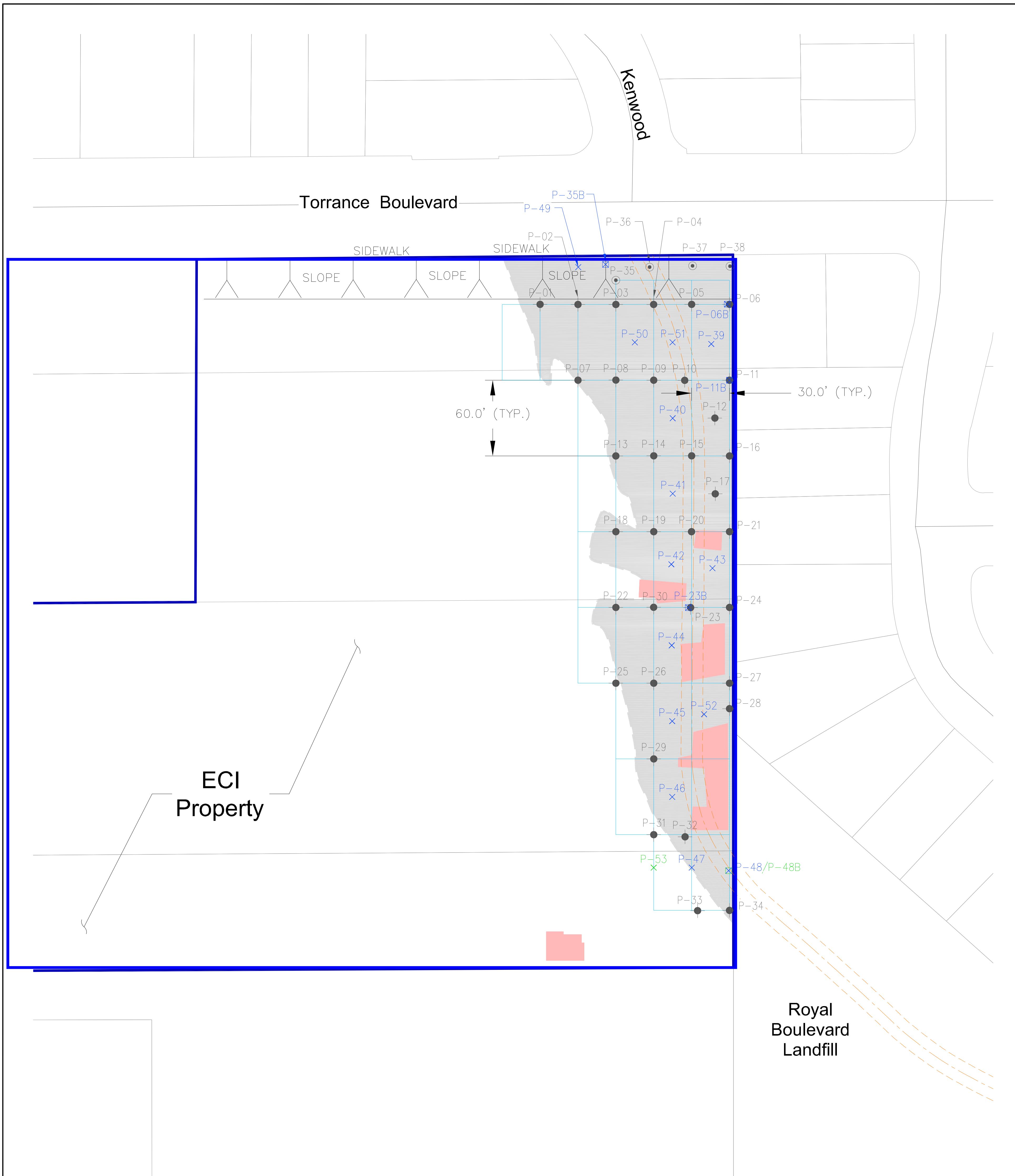
Historical Stormwater Pathway - South
Montrose Chemical Superfund Site
U.S. EPA Region 9
Los Angeles County, California

FIGURE 4
Topographic Map of ECI Property



Explanation:

ECI Property Boundary	On-Site ECI Property Soil Boring Location (To Delineate Deeper), Drilled June 2007
LACFCD Box Drain and Easement	On-Site ECI Property Soil Boring Step-Out Location (To Delineate Laterally), Drilled June 2007
On-Site ECI Property Soil Boring Location (24' Depth), Drilled July 2006	On-Site ECI Property Soil Boring Step-Out Location (To Delineate Deeper), Drilled August 2007
On-Site ECI Property Soil Boring Location (16' Depth), Drilled July 2006	On-Site ECI Property Soil Boring Step-Out Location (To Delineate Laterally), Drilled August 2007

Excavation Area (Surveyed Locations, July 2006)

LACAO Parcel

EPA Estimated Extent of the Historical Stormwater Pathway

References:

1. Los Angeles County Assessors Office, Los Angeles City Department of Public Works On-line GIS Parcel Database, Copyright 2006.
2. Source of Flood Control / Storm Water Channel: Los Angeles Flood Control District Map, revision date May 6, 1970, Sheet No. 428-RW3.1.
3. CH2M HILL FSP Report dated March 2006 for Excavation Areas.
4. USGS High Resolution Orthoimage, Los Angeles, CA dated March 29, 2004, 0.25 meter resolution Georeferenced from MS Terraserver, Copyright 2006.
5. On-Site ECI Soil Boring Locations Surveyed by Dulin & Boynton Surveyors, conducted July 26, 2006, June 14, 2007 and July 31, 2007.
6. Earth Tech, Draft Soil Investigation Report-Historic Storm Water Pathway, South ECI Industries Property, 20846 South Normandie Ave., Torrance, CA, December 21, 2006.

Source: Soil Investigation Report, Historic Storm Water Pathway, Earth Tech, Inc., 2008

NORTH

0 40 80 FEET

SCALE: 1"= 80'

Montrose Chemical Corporation — Revised 10/31/07

Final Soil Boring Location Map

Historical Stormwater Pathway

ECI Property

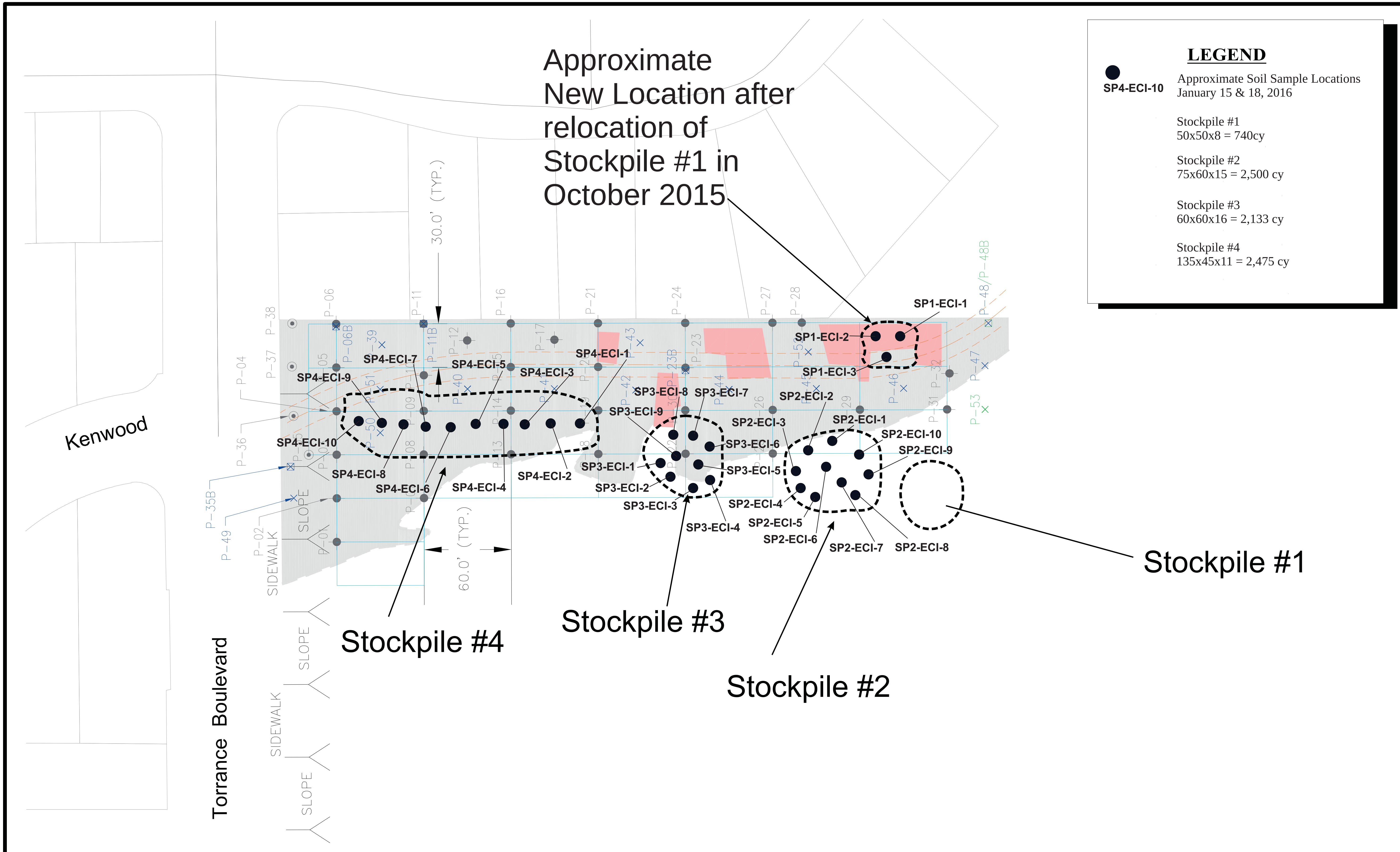
Date: 10-07

Project No. 99700

Sharp Environmental Technologies, Inc.

Figure 5

FILE NAME: 91496 MONTROSE ECI FSP.SBLM.1007.DWG (1:1)



N

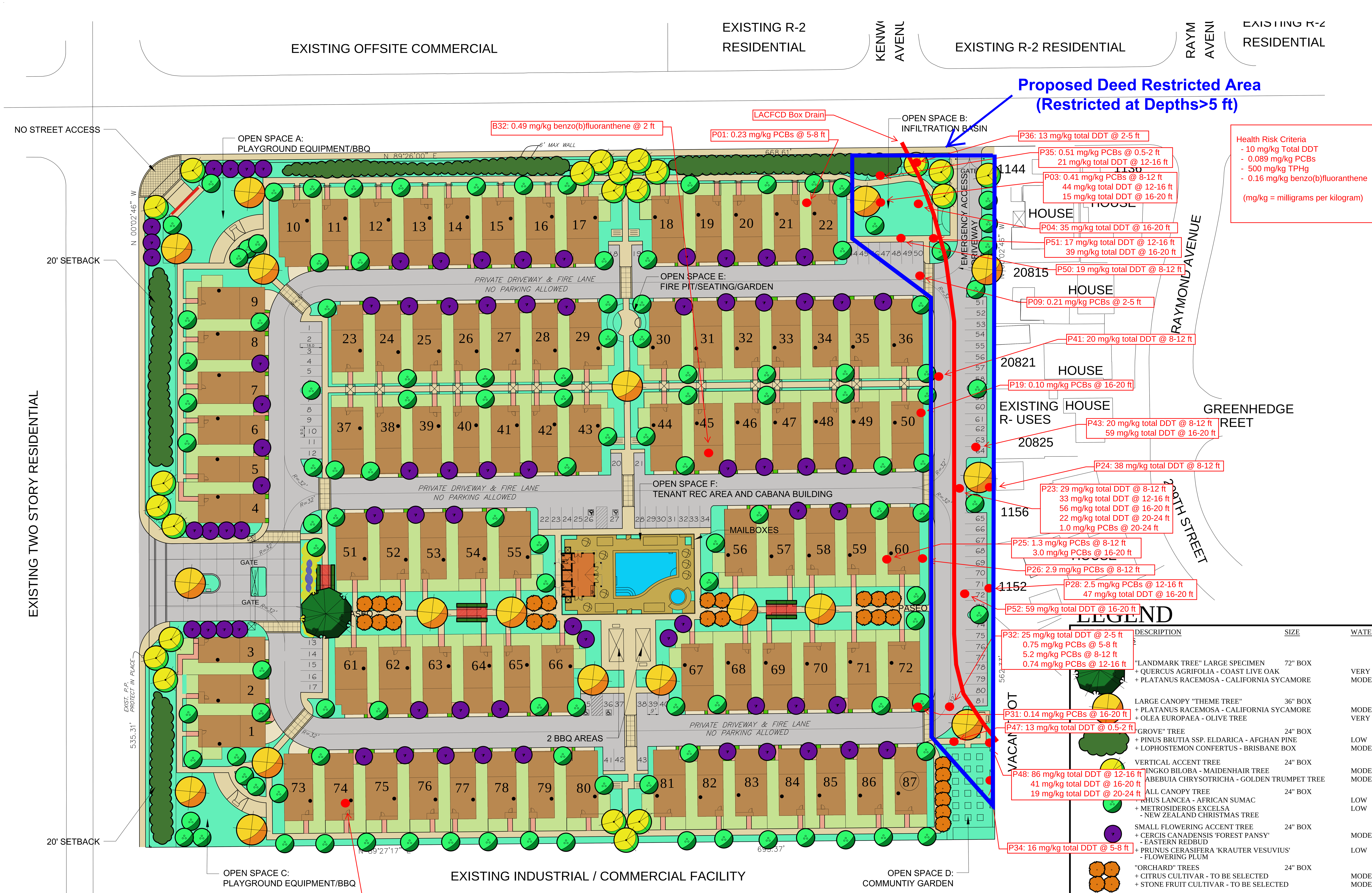
Date: 01/28/16
Drawn by: jes
Revised by: mrd

0 30 60
APPROXIMATE SCALE IN FEET

Reference: Revised Soil Investigation Report Historic Storm Water Pathway-South, Ecology Control Industries Property 20846 South Normandie Ave, Torrance, CA 90502 - Figure 6, Final Soil Boring Location Map, June 20, 2008. Prepared by Earth Tech, Inc. For Montrose Chemical Company of CA in Compliance with USEPA Unilateral Order UAO 09-2006-022 dated June 23, 2006.

SHARP ENVIRONMENTAL TECHNOLOGIES, INC.
839 S BEACON STREET #1967 PEDRO, CA. 90733
(310) 505-3675, Fax (310) 548-3935

Figure 6
Site Plan with Soil Stockpile Sample Locations
Ecology Control Industries
20846 Normandie Avenue
Torrance, California



OPEN SPACE CONCEPT PLAN

0 20' 40' 80'
SCALE: 1" = 40'

Summaries

Open Space Summary:			
Area Improvement	Size (SF/AC)	% of total site*	Improvement
Street Frontage Open Space	7,625 SF/.175 AC	2.02%	+ Shrubs, grasses and groundcovers
Public Open Space	81,976 SF/1.88 AC	21.7%	+ Landscaped and improved by Developer consistent with Conceptual Open Space Plan and conditioned by CUP. + Some small turf area (<25% of all open space areas); drought tolerant shrubs, grasses and groundcovers
Private Open Space	61,198 SF/1.40 AC	16.2%	+ Landscaped by Homeowners
Total Open Space	150,799 SF/ 3.46 AC	39.9%	+ Landscaped by Developer and Homeowners
Total Area	377,670 SF/ 8.67 AC*	100%	+ All materials to be drought tolerant

Public Open Space Summary:			
Area	Size (SF/AC)	% of total site*	Improvement
A:	7,480 SF/.172 AC	1.98%	+ Play equipment / Exercise equip. / bbq picnic area
B:	5,510 SF/.127 AC	1.46%	+ Infiltration basin area / Exercise equip.
C:	7,210 SF/.166 AC	1.91%	+ Play equipment / Exercise equip. / bbq picnic area
D:	5,575 SF/.128 AC	1.48%	+ Community garden / Exercise equip.
E:	4,468 SF/.103 AC	1.18%	+ Passive recreation area / fire pit / seating pockets / butterfly garden
F:	17,402 SF/.400 AC	4.61%	+ Active recreation area
Total	47,645 SF/1.09AC	12.62%	+ Six areas spread throughout the site

Hardscape summary:		
Area	Size (SF/AC)	% of total site*
Community Streets - Vehicular Paving	83,258 SF/1.91 AC	22.05%
Community Walkways - Sidewalks / Concrete Paving	43,886 SF/1.01 AC	11.62%
Private Entry Walkways - Pedestrian Entry Paving	7,148 SF/.164 AC	1.89%
Community Pool Deck - Decorative Pool Deck Paving	4,277 SF/.098 AC	1.13%
Community Pool / Spa	1,558 SF/.036 AC	0.41%
Cabana - Restrooms, Dressing area, Storage, Kitchenette	981 SF/.023 AC	0.26%
Total Hardscape Area	148,736 SF/3.42 AC	39.38%

LEGEND

DESCRIPTION	SIZE	WATER USE
"LANDMARK TREE" LARGE SPECIMEN	72" BOX	
+ QUERCUS AGRIFOLIA - COAST LIVE OAK		VERY LOW
+ PLATANUS RACEMOSA - CALIFORNIA SYCAMORE		MODERATE
LARGE CANOPY "THEME TREE"	36" BOX	
+ PLATANUS RACEMOSA - CALIFORNIA SYCAMORE		MODERATE
+ OLEA EUROPAEA - OLIVE TREE		VERY LOW
"GROVE" TREE	24" BOX	
+ PINUS BRUTIA SSP. ELDARICA - AFGHAN PINE		LOW
+ LOPHOSTEMON CONFERTUS - BRISBANE BOX		MODERATE
VERTICAL ACCENT TREE	24" BOX	
+ GINGKO BILOBA - MAIDENHAIR TREE		MODERATE
+ TABEBUIA CHRYSOTRICHA - GOLDEN TRUMPET TREE		MODERATE
SMALL CANOPY TREE	24" BOX	
+ RHUS LANCEA - AFRICAN SUMAC		LOW
+ METROSIDEROS EXCELSA - NEW ZEALAND CHRISTMAS TREE		LOW
SMALL FLOWERING ACCENT TREE	24" BOX	
+ CERCIS CANADENSIS 'FOREST PANSY' - EASTERN REDBUD		MODERATE
+ PRUNUS CERASIFERA 'KRAUTER VESUVIUS' - FLOWERING PLUM		LOW
"ORCHARD" TREES	24" BOX	
+ CITRUS CULTIVAR - TO BE SELECTED		MODERATE
+ STONE FRUIT CULTIVAR - TO BE SELECTED		MODERATE
SMALL ACCENT TREE	24" BOX	
+ ARBUTUS UNEDO - STRAWBERRY TREE		LOW
+ RHAPHIOLEPIS 'MAJESTIC BEAUTY' - INDIAN HAWTHORNE		LOW
SMALL VERTICAL ACCENT	15 GAL.	
+ CUPRESSUS 'TINY TOWERS' - ITALIAN CYPRESS		LOW
+ PODOCARPUS HENKELII - LONG-LEAFED YELLOWWOOD		MODERATE

SYMBOL DESCRIPTION
MISCELLANEOUS

PROJECT SIGNAGE ELEMENT
ENTRY ACCENT PLANTING
GRAPE VINE ARBOR

FIGURE 7-
PROPOSED
RESIDENTIAL
REDEVELOPMENT PLAN

PROJECT ADDRESS
NORMANDIE PLACE
20850 NORMANDIE AVENUE
TORRANCE, CA 90502
A PROPOSED 89 UNITS DETACHED HOME PROJECT

PROPERTY MANAGER
WARMINGTON RESIDENTIAL
3090 PULLMAN STREET
COSTA MESA, CA 92626
PH: 714-434-4448

LANDSCAPE ARCHITECT
JDC Landscape Architects
JON DAVID CICCHETTI
2760 E. SPRING ST., SUITE 110
LONG BEACH, CA 90806
562. 989.1880

REVISIONS / SUBMITTALS
05/18/15 - AGENCY SUBMITTAL

SHEET TITLE
OPEN SPACE CONCEPT PLAN
SUPPORTS
-87 UNIT DETACHED HOMES
-ZC 201400012
-VTTM 72641
-CUP 201400157

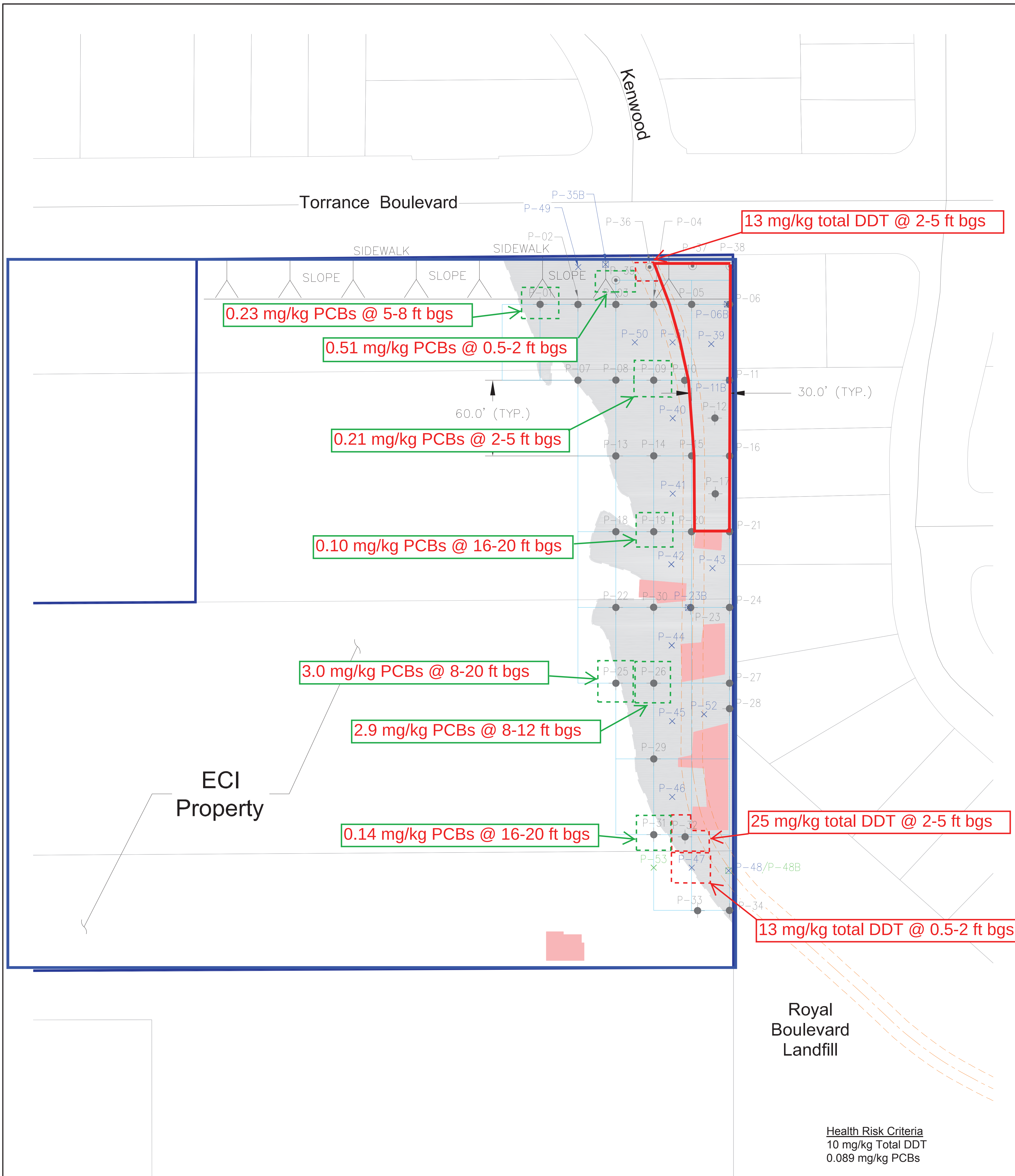
NORTH

SCALE
1" = 40'-0"

JOB NO.
14-16

DATE
01/09/15

SHEET NO.
OS-1
OF 4 SHEETS



Explanation:

- ECI Property Boundary
- LACFCD Box Drain and Easement
- On-Site ECI Property Soil Boring Location (24' Depth), Drilled July 2006
- On-Site ECI Property Soil Boring Location (16' Depth), Drilled July 2006
- On-Site ECI Property Soil Boring Location (To Delineate Deeper), Drilled June 2007
- On-Site ECI Property Soil Boring Step-Out Location (To Delineate Laterally), Drilled June 2007
- On-Site ECI Property Soil Boring Step-Out Location (To Delineate Deeper), Drilled August 2007
- On-Site ECI Property Soil Boring Step-Out Location (To Delineate Laterally), Drilled August 2007
- 2015 Excavation Area
- Excavation Area (Surveyed Locations, July 2006)
- LACAO Parcel
- EPA Estimated Extent of the Historical Stormwater Pathway
- Proposed DDT excavation area
- Proposed PCB excavation area

NORTH

0 40 80 FEET

SCALE: 1"= 80'

References:

1. Los Angeles County Assessors Office, Los Angeles City Department of Public Works On-line GIS Parcel Database, Copyright 2006.
2. Source of Flood Control / Storm Water Channel: Los Angeles Flood Control District Map, revision date May 6, 1970, Sheet No. 428-RW3.1.
3. CH2M HILL FSP Report dated March 2006 for Excavation Areas.
4. USGS High Resolution Orthoimage, Los Angeles, CA dated March 29, 2004, 0.25 meter resolution Georeferenced from MS Terraserver, Copyright 2006.
5. On-Site ECI Soil Boring Locations Surveyed by Dulin & Boynton Surveyors, conducted July 26, 2006, June 14, 2007 and July 31, 2007.
6. Earth Tech, Draft Soil Investigation Report-Historic Storm Water Pathway, South ECI Industries Property, 20846 South Normandie Ave., Torrance, CA, December 21, 2006.

Source: Soil Investigation Report, Historic Storm Water Pathway, Earth Tech, Inc., 2008

FILE NAME: 91496 MONTROSE ECI FSP SBLM.1007.DWG (1:1)

Montrose Chemical Corporation | Revised 10/31/07

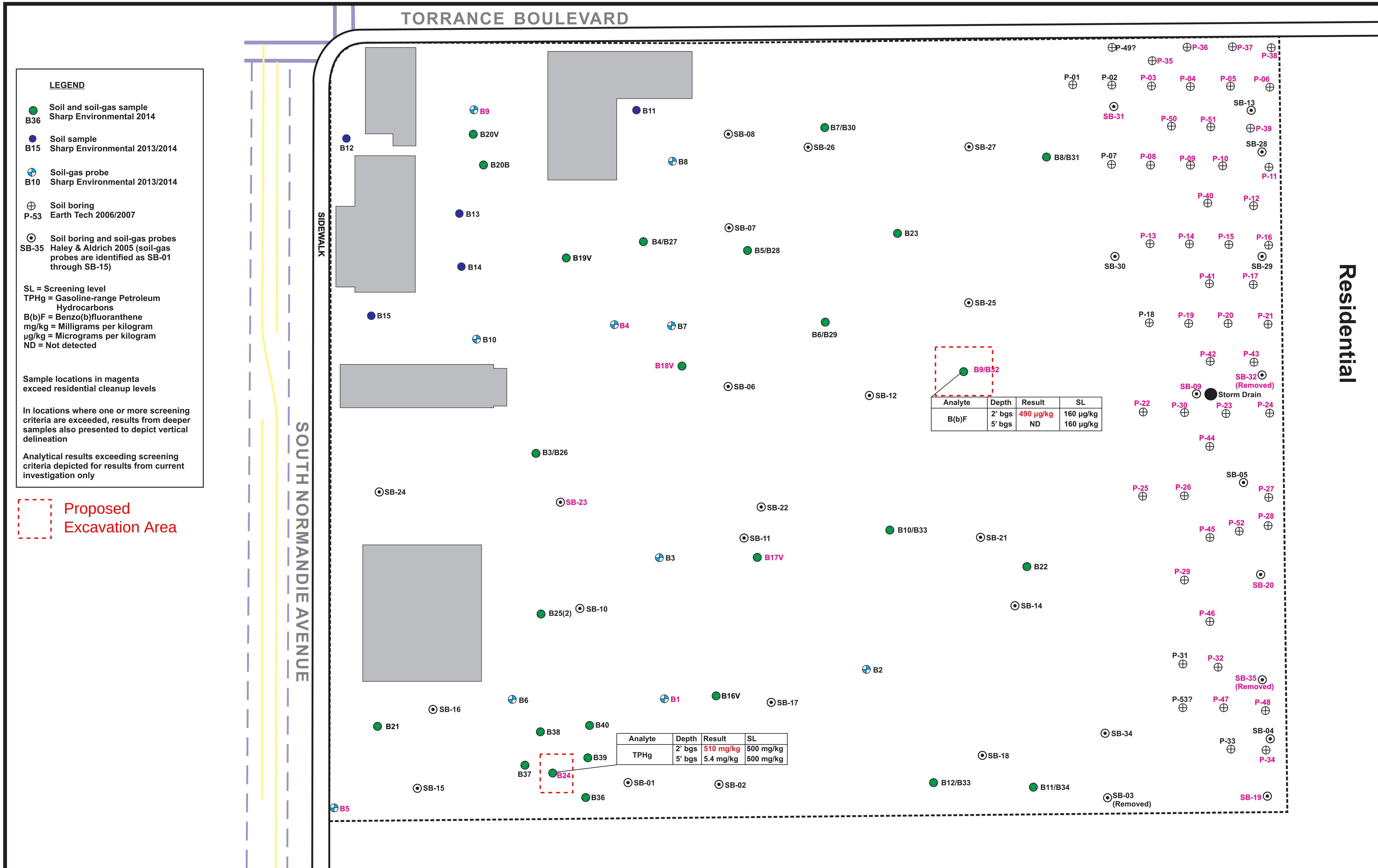
Additional Excavation Areas
Deed Restrictions Under Eastern Road
Historical Stormwater Pathway

Date: 10-07 | ECI Property

Project No. 99700

Sharp Environmental Technologies, Inc.

Figure 8



Analyte	Depth	Result	SL
B(b)F	2' bgs	490 µg/kg	160 µg/kg
	5' bgs	ND	160 µg/kg

Analyte	Depth	Result	SL
TPHg	2' bgs	510 mg/kg	500 mg/kg
	5' bgs	5.4 mg/kg	500 mg/kg

0 25 50
Approximate Scale in Feet

SET Project Number: 21-366

Date: March 2015

Prepared by: GB
Reviewed by: JES

Reference: Google Earth, 2014

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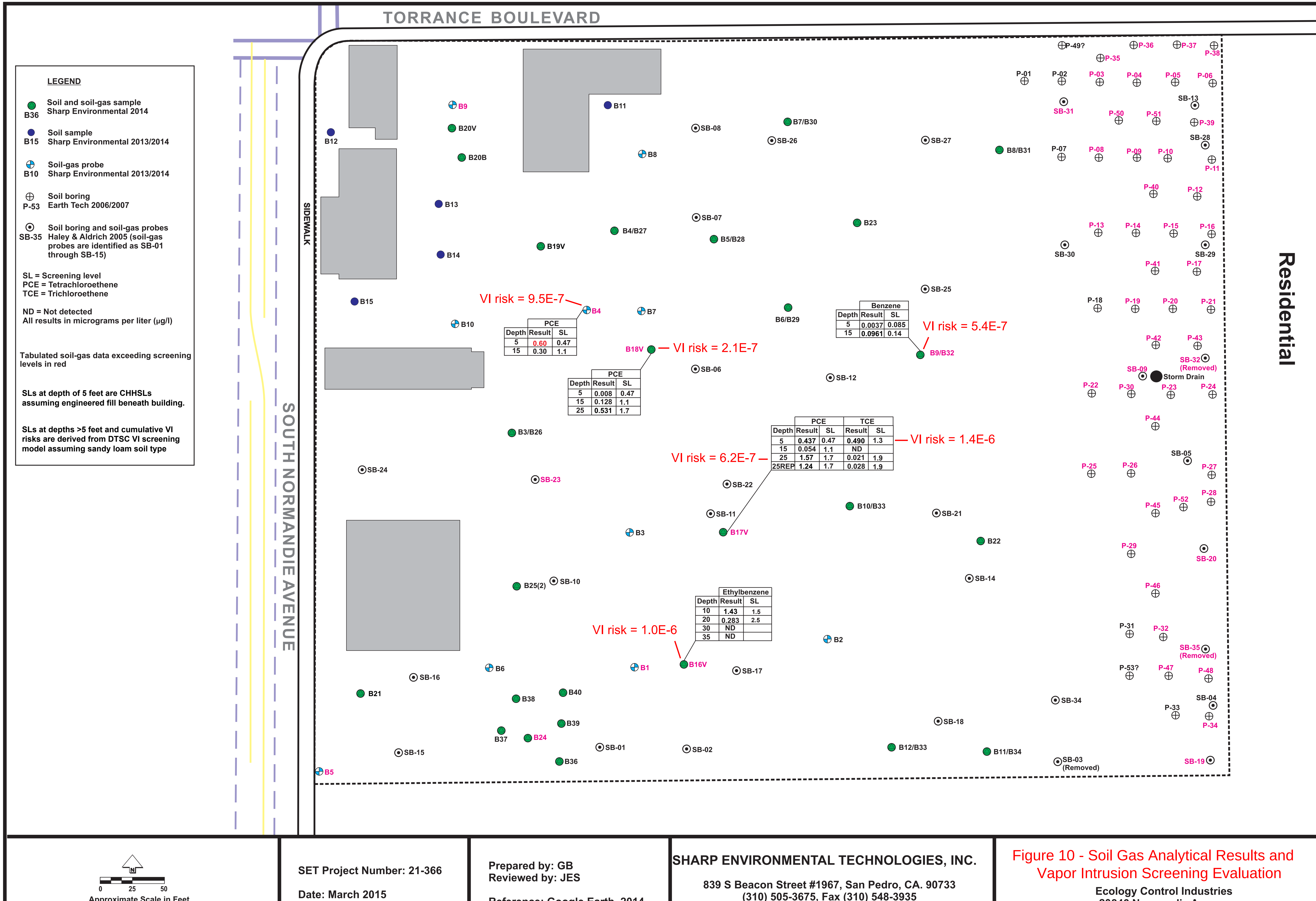
Figure 9 - Additional Excavation Areas West of Historical Stormwater Pathway

Ecology Control Industries
20846 Normandie Avenue
Torrance, California 90502



SET Project Number: 21-366

Date: March 2015

Prepared by: GB
Reviewed by: JES

Reference: Google Earth, 2014

SHARP ENVIRONMENTAL TECHNOLOGIES, INC.

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(310) 505-3675, Fax (310) 548-3935

Figure 10 - Soil Gas Analytical Results and Vapor Intrusion Screening Evaluation

Ecology Control Industries
20846 Normandie Avenue
Torrance, California 90502

TABLE

Table 1

draft Table 1
Soil Laboratory Analytical Results - Stockpile Profile Results
20846 Normandie Avenue
Torrance, California 90502

Analyte Suite			Title 22 (CAM 17) Metals																		
EPA Method			6010B																		7471A
Sample ID	Stock-pile ID	Sample Date	Sb mg/kg	As mg/kg	Ba mg/kg	Be mg/kg	Cd mg/kg	Cr mg/kg	Co mg/kg	Cu mg/kg	Pb TTLC mg/kg	Pb STLC mg/l	Pb TCLPm g/l	Mo mg/kg	Ni mg/kg	Se mg/kg	Ag mg/kg	Tl mg/kg	V mg/kg	Zn mg/kg	Hg mg/kg
TTLC (mg/kg for metals, µg/kg for OCPs)			500	500	10,000	75	100	2,500	8,000	2,500	1,000	-	-	3,500	2,000	100	500	700	2,400	5,000	20
STLC California Hazardous Threshold (µg/l)			15	5	100	0.75	1.0	5(560)	80	25	-	5	-	350	20	1.0	5	7.0	24	250	0.2
TCLP RCRA Hazardous Threshold (µg/l)			NE	5	100	NE	1.0	5	NE	NE	-	-	5	NE	NE	1.0	5	NE	NE	NE	0.2
SC19	1	7/20/2015	ND	ND	149	ND	ND	30.6	9.6	34.2	39.6	-	-	ND	31.0	ND	ND	ND	36.0	131	0.054
SC20	1	7/20/2015	ND	ND	136	ND	ND	24.5	8.2	27.8	33.8	-	-	ND	23.8	ND	ND	ND	37.3	112	0.038
SC21	3	7/20/2015	ND	8.0	127	ND	ND	37.9	12.7	38.9	16.3	-	-	ND	34.5	ND	ND	ND	44.2	92.0	0.064
SC22	3	7/20/2015	ND	ND	145	ND	ND	25.0	11.5	23.4	7.7	-	-	ND	18.5	ND	ND	ND	39.4	76.2	0.064
SC23	3	7/20/2015	ND	3.1	152	ND	ND	29.6	10.4	33.0	32.2	-	-	ND	26.0	ND	ND	ND	37.5	137	0.023
SC24	3	7/20/2015	ND	8.7	158	ND	ND	44.5	14.5	42.2	19.5	-	-	ND	37.8	ND	ND	ND	50.2	104	0.056
SC25	3	7/20/2015	ND	7.6	115	ND	ND	36.4	11.1	33.6	12.0	-	-	ND	33.0	ND	ND	ND	40.1	77.0	0.067
SC26	3	7/20/2015	ND	4.0	130	ND	ND	30.1	909	33.0	31.3	-	-	ND	28.8	ND	ND	ND	37.2	131	0.057
SC27	3	7/20/2015	ND	5.2	143	ND	ND	33.2	11.2	36.8	30.6	-	-	ND	30.8	ND	ND	ND	41.4	146	0.073
SC28	3	7/20/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SC29	3	7/20/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SC30	3	7/20/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SC31	3	7/20/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SC32	3	7/20/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SC33	3	7/20/2015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SP34	2	8/11/2015	<1	9.4	190	<1	1.0	28	14	35	44	-	-	<1	25	<1	<1	<1	53	170	<0.05
SP35	2	8/11/2015	<1	10	190	<1	1.6	25	11	47	**100**			<1	28	<1	<1	<1	43	400	<0.05
SP36	2	8/11/2015	<1	**13**	220	<1	1.6	29	14	40	68	-	-	<1	25	<1	<1	<1	50	260	<0.05
SP37	2	8/11/2015	<1	8.2	140	<1	1.1	19	9.3	27	55	-	-	<1	17	<1	<1	<1	34	190	<0.05
SP38	2	8/11/2015	<1	8.8	190	<1	1.9	25	12	37	48	-	-	<1	20	<1	<1	<1	46	220	<0.05
SP39	2	8/11/2015	<1	6.5	190	<1	1.1	26	11	35	70	-	-	<1	21	<1	<1	<1	43	170	<0.05
SP40	4	8/11/2015	<1	11	210	<1	<1	36	17	42	55	-	-	<1	42	<1	<1	<1	61	180	<0.05
SP41	4	8/11/2015	<1	9.0	170	<1	1.0	25	13	31	41	-	-	<1	26	<1	<1	<1	43	190	<0.05
SP42	4	8/11/2015	<1	5.6	140	<1	<1	17	9.1	360	**100**			<1	23	<1	<1	<1	32	180	<0.05
SP43	4	8/11/2015	<1	7.3	190	<1	<1	26	12	33	50			<1	28	<1	<1	<1	46	190	<0.05
SP44	4	8/11/2015	<1	11	160	<1	<1	24	11	36	60			<1	19	<1	<1	<1	40	280	<0.05
SP45	4	8/11/2015	<1	12	160	<1	<1	24	14	31	39			<1	21	<1	<1	<1	49	220	<0.05
SP46	4	8/11/2015	<1	9.0	180	<1	1.4	29	13	33	74			<1	23	<1	<1	<1	50	240	<0.05
SP47	2	8/11/2015	<1	**22**	170	<1	2.4	66	11	140	**180**			<1	56	<1	<1	<1	45	760	<0.05
SP1-ECI-1	1	1/15/2016																			
SP1-ECI-2	1	1/15/2016																			
SP1-ECI-3	1	1/15/2016																			
SP2-ECI-1	2	1/15/2016																			
SP2-ECI-2	2	1/15/2016																			
SP2-ECI-3	2	1/15/2016																			
SP2-ECI-4	2	1/15/2016																			
SP2-ECI-5	2	1/15/2016																			
SP2-ECI-6	2	1/15/2016																			
SP2-ECI-7	2	1/15/2016																			
SP2-ECI-8	2	1/15/2016																			
SP2-ECI-9	2	1/15/2016																			
SP2-ECI-10	2	1/15/2016																			
SP2-ECI-Dup	2	1/15/2016																			
SP3-ECI-1	3	1/15/2016																			
SP3-ECI-2	3	1/15/2016																			
SP3-ECI-3	3	1/15/2016																			
SP3-ECI-4	3	1/15/2016																			
SP3-ECI-5	3	1/15/2016																			
SP3-ECI-6	3	1/15/2016																			

Analyte Suite	Organichlorine Pesticides (OCPs)																					Total Petroleum Hydrocarbons (TPH)			Volatile Organic Compounds (VOCs)	Semi-Volatile Organic Compounds (SVOCs)	Polychlorinated Biphenyls (PCBs)
EPA Method	8081A																					8015M			8260B	8270C	8082
	alpha- chlordane		gamma-chlordane		ChlordaneTechnical Chlordane		Dieldrin					4,4'-DDE			4,4'-DDD			4,4'-DDT									
Sample ID	TTLC µg/kg	TCLP µg/l	TTLC µg/kg	TCLP µg/l	TTLC µg/kg	TCLP µg/l	TTLC µg/kg	STLC µg/l	TCLP µg/l	Endo-sulfan µg/kg	Hepta-chlor µg/kg	TTLC µg/kg	STLC µg/l	TCLP µg/l	TTLC µg/kg	STLC µg/l	TCLP µg/l	TTLC µg/kg	STLC µg/l	TCLP µg/l	All Other OCPs µg/kg	TPHg mg/kg	TPHd mg/kg	TPHo mg/kg	All VOCs µg/kg	All SVOCs µg/kg	All PCBs µg/kg
TTLC (mg/kg for metals, µg/kg for OCPs)	NE	NE	NE	NE	2,500	-	8,000	-	-	NE	4,700	1,000	-	-	1,000	-	-	1,000	-	-	Varies	NE	NE	NE	Varies	Varies	Varies
STLC California Hazardous Threshold (µg/l)	NE	NE	NE	NE	250	-	-	800	-	NE	470	-	100	-	-	100	-	-	100	-	Varies	NE	NE	NE	Varies	Varies	Varies
TCLP RCRA Hazardous Threshold (µg/l)	NE	NE	NE	NE	-	30	-	-	NE	NE	8	-		NE	-		NE	-		NE	Varies	NE	NE	NE	Varies	Varies	Varies
SC19	29	-	67	-	-	-	ND	-	-	10	ND	610^{E}	-	-	93^{E}	-	-	**3800**	-	-	ND	ND	ND	ND	ND	-	ND
SC20	26	-	54	-	-	-	ND	-	-	ND	ND	550^{E}	-	-	900^{E}	-	-	**2600**	-	-	ND	ND	ND	ND	ND	-	ND
SC21	ND	-	ND	-	-	-	ND	-	-	ND	ND	130	-	-	520^{E}	-	-	**2000E**	-	-	ND	ND	ND	ND	ND	-	ND
SC22	ND	-	ND	-	-	-	ND	-	-	11	ND	68	-	-	460	-	-	680	-	-	ND	ND	ND	ND	ND	-	ND
SC23	ND	-	57	-	-	-	1000	-	-	38	ND	750^{E}	-	-	**3000**	-	-	**14000**	-	-	ND	ND	ND	ND	ND	-	ND
SC24	ND	-	26	-	-	-	ND	-	-	ND	ND	210	-	-	540^{E}	-	-	**4700**	-	-	ND	ND	ND	ND	ND	-	ND
SC25	ND	-	ND	-	-	-	ND	-	-	ND	ND	31	-	-	150	-	-	290	-	-	ND	ND	ND	ND	ND	-	ND
SC26	ND	-	54	-	-	-	ND	-	-	11	ND	690^{E}	-	-	**1900E**	-	-	**11000E**	-	-	ND	ND	ND	ND	ND	-	ND
SC27	ND	-	96	-	-	-	ND	-	-	31	ND	**1300E**	-	-	**4400E**	-	-	**20000E**	-	-	ND	ND	ND	ND	ND	-	ND
SC28	14	-	60	-	-	-	ND	-	-	35	ND	**1000E**	-	-	**2200E**	-	-	**20000E**	-	-	ND	-	-	-	-	-	-
SC29	28	-	100	-	-	-	ND	-	-	54	ND	**1700E**	-	-	**4200E**	-	-	**31000**	-	-	ND	-	-	-	-	-	-
SC30	34	-	100	-	-	-	ND	-	-	33	ND	**1300E**	-	-	**3000E**	-	-	**21000E**	-	-	ND	-	-	-	-	-	-
SC31	16	-	60	-	-	-	ND	-	-	21	ND	620^{E}	-	-	**1500**	-	-	**9800**	-	-	ND	-	-	-	-	-	-
SC32	ND	-	ND	-	-	-	ND	-	-	ND	ND	**3800E**	-	-	**20000**	-	-	**190000**	-	-	12 (alpha-BHC), 24 (beta-BHC)	-	-	-	-	-	-
SC33	ND	-	ND	-	-	-	ND	-	-	ND	ND	94	-	-	280^{E}	-	-	2900^{E}	-	-	ND	-	-	-	-	-	-
SP34	<3.0	-	<3.0	-								**1900**	-	-	**8900**	-	-	**22000**	-	-		<0.1	<1	<5	<2-20	<250	<25
SP35	<3.0	-	<3.0	-								**4000**	-	-	**14000**	-	-	**27000**	-	-		<0.1	<1	<5	<2-20	<250	<25
SP36	<3.0	-	<3.0	-								**1700**	-	-	**9500**	-	-	**19000**	-	-		<0.1	<1	<5	<2-20	<250	<25
SP37	<3.0	-	<3.0	-								**4800**	-	-	**25000**	-	-	**61000**	-	-		<0.1	<1	<5	<2-20	<250	<25
SP38	<3.0	-	<3.0	-								**2700**	-	-	**14000**	-	-	**11000**	-	-		<0.1	<1	<5	<2-20	<250	<25
SP39	<3.0	-	<3.0	-								**1400**	-	-	**2000**	-	-	**65000**	-	-		<0.1	<1	<5	<2-20	<250	<25
SP40	<3.0	-	<3.0	-								**5300**	-	-	**46000**	-	-	**180000**	-	-		<0.1	<1	<5	<2-20	<250	<25
SP41	<3.0	-	<3.0	-								**8000**	-	-	**13000**	-	-	**34000**	-	-		<0.1	<1	200	<2-20	<250	<25
SP42	<3.0	-	<3.0	-								**2800**	-	-	**4200**	-	-	**20000**	-	-		<0.1	<1	<5	<2-20	<250	<25
SP43	<3.0	-	<3.0	-								**1600**	-	-	**3200**	-	-	**9800**	-	-		<0.1	<1	170	<2-20	<250	<25
SP44	<3.0	-	<3.0	-								**3000**	-	-	**28000**	-	-	**36000**	-	-		<0.1	<1	230	<2-20	<250	<25
SP45	<3.0	-	<3.0	-								**23000**	-	-	**150000**	-	-	**750000**	-	-		<0.1	<1	120	<2-20	<250	<25
SP46	<3.0	-	<3.0	-								**7200**	-	-	**21000**	-	-	**95000**	-	-		<0.1	<1	<5	<2-20	<250	<25
SP47	<3.0	-	<3.0	-								**16000**	-	-	**41000**	-	-	**180000**	-	-		ND	ND	160	<2-20	<250	<25
SP1-ECI-1	-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	**2440**	-	-	<1,500	-	-	**15500**	-	-							
SP1-ECI-2	-	-	-	-	450	-	177	-	-	<30	<30	541	-	-	<30	-	-	503	-	-							
SP1-ECI-3	-	-	-	-	543	-	149	-	-	<30	<30	535	-	-	<30	-	-	398	-	-							
SP2-ECI-1	-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	**3860**	-	-	<1,500	-	-	**30500**	-	-							
SP2-ECI-2	-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	**16300***	-	-	<1,500	-	-	**298000**	-	-							
SP2-ECI-3	-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	**2570**	-	-	<1,500	-	-	**20400**	-	-							
SP2-ECI-4	-	-	-	-	<15,000	-	<3,000	-	-	<3,000	<3,000	**12700**	-	-	<3,000	-	-	**142000**	-	-							
SP2-ECI-5	-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	**9380**	-	-	<1,500	-	-	**81900***	-	-							
SP2-ECI-6	-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	**40100***	-	-	<1,500	-	-	**552000***	-	-							
SP2-ECI-7	-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	**52400***	-	-	<1,500	-	-	**589000***	-	-							
SP2-ECI-8	-	-	-	-	<15,000	-	<3,000	-	-	<3,000	<3,000	**18300**	-	-	<3,000	-	-	**242000***	-	-							
SP2-ECI-9	-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	**9400**	-	-	<1,500	-	-	**133000***	-	-							
SP2-ECI-10	-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	**7670**	-	-	<1,500	-	-	**98900***	-	-							
SP2-ECI-Dup	-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	**6620**	-	-	<1,500	-	-	**84700***	-	-							
SP3-ECI-1	-	-	-	-	<150	-	<30	-	-	<30	<30	962	-	-	<30	-	-	**14400***	-	-							
SP3-ECI-2	-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	**1960**	-	-	<1,500	-	-	**18800**	-	-							
SP3-ECI-3	-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	**1340**	-	-	<1,500	-	-	**11000**	-	-							
SP3-ECI-4	-	-	-	-	<3,000	-	<600	-	-	<600	<600	**1380**	-	-	<600	-	-	**11000**	-	-							
SP3-ECI-5	-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	**3760**	-	-	<1,500	-	-	**38300**	-	-							
SP3-ECI-6	-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	**4810**	-	-	<1,500	-	-	**56800**	-	-							

draft Table 1
Soil Laboratory Analytical Results - Stockpile Profile Results
20846 Normandie Avenue
Torrance, California 90502

SP3-ECI-7	3	1/15/2016																				-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	3730	-	-	<1,500	-	-	40300	-	-							
SP3-ECI-8	3	1/15/2016																				-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	4170	-	-	<1,500	-	-	32800	-	-							
SP3-ECI-9	3	1/15/2016																				-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	3640	-	-	<1,500	-	-	32800	-	-							
SP3-ECI-Dup	3	1/15/2016																				-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	5440	-	-	<1,500	-	-	58300	-	-							
SP4-ECI-1	4	1/18/2016																				-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	2130	-	-	<1,500	-	-	15300	-	-							
SP4-ECI-2	4	1/18/2016																				-	-	-	-	<750	-	<150	-	-	<150	<150	855	-	-	<150	-	-	7000	-	-							
SP4-ECI-3	4	1/18/2016																				-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	3620	-	-	<1,500	-	-	31300	-	-							
SP4-ECI-4	4	1/18/2016																				-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	8900	-	-	<1,500	-	-	110000*	-	-							
SP4-ECI-5	4	1/18/2016																				-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	5400	-	-	<1,500	-	-	46200	-	-							
SP4-ECI-6	4	1/18/2016																				-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	59500*	-	-	<1,500	-	-	711000*	-	-							
SP4-ECI-7	4	1/18/2016																				-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	9700	-	-	<1,500	-	-	109000*	-	-							
SP4-ECI-8	4	1/18/2016																				-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	10300	-	-	<1,500	-	-	82200*	-	-							
SP4-ECI-9	4	1/18/2016																				-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	7090	-	-	<1,500	-	-	70900*	-	-							
SP4-ECI-10	4	1/18/2016																				-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	10200	-	-	<1,500	-	-	122000*	-	-							
SP4-ECI-Dup	4	1/18/2016																				-	-	-	-	<7,500	-	<1,500	-	-	<1,500	<1,500	3630	-	-	<1,500	-	-	32500	-	-							

Notes:

mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
mg/l = milligrams per liter
µg/l = micrograms per liter
EPA = Environmental Protection Agency
ND = Non-detect
NE = Not Established (i.e. not a driver for waste characterization)
Non-detections tabulated as "<PQL" where appropriate
PQL = Practical Quantitation Limit
- = Not Analyzed
E = Estimated concentration; value is below adjusted PQL
TTLC = Total Threshold Limit Concentration
STLC = Soluble Threshold Limit Concentration
TCLP = Toxicity Characteristic Leaching Procedure
RCRA = Resource Conservation and Recovery Act
All analysis is TTLC unless otherwise indicated as STLC or TCLP
Dup = Duplicates submitted blindly to laboratory
TPHg = Gasoline-range petroleum hydrocarbons
TPHd = Diesel-range petroleum hydrocarbons
TPHo = Oil-range petroleum hydrocarbons
Highlighted: Result exceeds the applicable TTLC, STLC or TCLP limit

Sb = Antimony
As = Arsenic
Ba = Barium
Be = Beryllium
Cd = Cadmium
Cr = Chromium
Co = Cobalt
Cu = Copper
Pb = Lead
Mo = Molybdenum
Ni = Nickel
Se = Selenium
Ag = Silver
Tl = Thallium
V = Vanadium
Hg = Mercury

APPENDIX A

USEPA Unilateral Administrative Order

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IX

IN THE MATTER OF: Ecology Control Industries, Inc. Mr. Ronald J. Flury, and Montrose Chemical Corporation of California, Respondents Proceeding under Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. § 9606(a).	)	U.S. EPA Region IX CERCLA Docket No. 2016-01 **UNILATERAL ADMINISTRATIVE ORDER FOR REMOVAL ACTIONS**

UNILATERAL ADMINISTRATIVE ORDER FOR REMOVAL ACTIONS

TABLE OF CONTENTS

I. JURISDICTION AND GENERAL PROVISIONS

1. This Administrative Order ("Order") is issued under the authority vested in the President of the United States by Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act, (CERCLA), 42 U.S.C. § 9606(a). This authority was delegated to the Administrator of the United States Environmental Protection Agency (EPA) by Executive Order No. 12580, 52 Fed. Reg. 2923 (Jan. 23, 1987), and further delegated to the Regional Administrators by EPA Delegation Nos. 14-14-A and 14-14-B. This authority was further redelegated by the Regional Administrator of EPA Region IX to the Superfund Branch Chief by Regional Delegations R9-1290.13 (dated September 29, 1997) and R9-1290.14A (dated November 14, 2001).

2. This Order pertains to property located at 20846 Normandie Avenue in Torrance, Los Angeles County, California (the "ECI Property" or "Site"). This Order requires Respondents to conduct removal actions described herein to abate an imminent and substantial endangerment to the public health or welfare or the environment that may be presented by the actual or threatened release of hazardous substances at or from the Site.

3. EPA has notified the State of California (the "State") of this action pursuant to Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

II. PARTIES BOUND

4. This Order applies to and is binding upon Respondents and their heirs, successors, and assigns. Any change in ownership or control of the Site or change in the corporate or partnership status of a Respondent, including, but not limited to, any transfer of assets or real or personal property, shall not alter Respondents' responsibilities under this Order.

5. Respondents are jointly and severally liable for implementing all activities required by this Order. Compliance or noncompliance by any Respondent with any provision of this Order shall not excuse or justify noncompliance by any other Respondents. No Respondent shall interfere in any way with performance of the Work in accordance with this Order by any other Respondent. In the event of the insolvency or other failure of any Respondent to implement the requirements of this Order, the remaining Respondents shall complete all such requirements.

6. Respondents shall provide a copy of this Order to each contractor hired to perform the Work required by this Order and to each person representing any Respondents with respect to the Site or the Work, and shall condition all contracts entered into hereunder upon performance of the Work in conformity with the terms of this Order. Respondents or their contractors shall provide written notice of the Order to all subcontractors hired to perform any portion of the Work required by this Order. Respondents shall nonetheless be responsible for ensuring that their contractors and subcontractors perform the Work in accordance with the terms of this Order.

III. DEFINITIONS

7. Unless otherwise expressly provided in this Order, terms used in this Order that are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Order or in appendices to or documents incorporated by reference into this Order, the following definitions shall apply:

"Affected Property" shall mean all real property where EPA determines, at any time, that access or land, water, or other resource use restrictions are needed to implement the removal action, including, but not limited to, the property located at 20846 Normandie Avenue, Torrance, Los Angeles County, California. Affected Property includes the following parcels: Los Angeles County Tax Assessor Parcel Numbers 7348-020-003, 7348-020-004, 7348-020-007 and 7348-020-008.

"CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§ 9601-9675.

"Day" or "day" shall mean a calendar day. In computing any period of time under this Order, where the last day would fall on a Saturday, Sunday, or federal or State holiday, the period shall run until the close of business of the next working day.

"Effective Date" shall mean the effective date of this Order as provided in Section VIII.

"EPA" shall mean the United States Environmental Protection Agency and its successor departments, agencies, or instrumentalities.

"EPA Hazardous Substance Superfund" shall mean the Hazardous Substance Superfund established by the Internal Revenue Code, 26 U.S.C. § 9507.

"DTSC" shall mean the California Department of Toxic Substances Control and any successor departments or agencies of the State.

"ECI Property" or "Site" shall mean the real property located at 20846 Normandie Avenue, Torrance, Los Angeles County, California, which consists of the following parcels: Los Angeles County Tax Assessor Parcel Numbers 7348-020-003, 7348-020-004, 7348-020-007 and 7348-020-008.

"Interest" shall mean interest at the rate specified for interest on investments of the EPA Hazardous Substance Superfund established by 26 U.S.C. § 9507, compounded annually on October 1 of each year, in accordance with 42 U.S.C. § 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year. Rates are available online at http://www.epa.gov/ocfopage/finstatement/superfund/int_rate.htm.

"National Contingency Plan" or "NCP" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. § 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.

"Order" shall mean this Unilateral Administrative Order and all appendices attached hereto. In the event of conflict between this Order and any appendix, this Order shall control.

"Owner Respondent" shall mean any Respondent that owns or controls any Affected Property, including ECI and Mr. Ronald Flury. The clause "Owner Respondent's Affected Property" means Affected Property owned or controlled by Owner Respondent.

"Paragraph" shall mean a portion of this Order identified by an Arabic numeral or an upper or lower case letter.

"Parties" shall mean EPA and Respondents.

"RCRA" shall mean the Resource Conservation and Recovery Act, also known as the Solid Waste Disposal Act, 42 U.S.C. §§ 6901-6992.

"Respondents" shall mean Ecology Control Industries, Inc. ("ECI"), Mr. Ronald Flury, and Montrose Chemical Corporation of California ("Montrose").

"Response Costs" shall mean all costs, including, but not limited to, direct and indirect costs, that the United States incurs in monitoring and supervising Respondents' performance of the Work to determine whether such performance is consistent with the requirements of this Order, including costs incurred in reviewing deliverables submitted pursuant to this Order, as well as costs incurred in overseeing implementation of this Order, including, but not limited to, payroll costs, contractor costs, travel costs, and laboratory costs.

"Section" shall mean a portion of this Order identified by a Roman numeral.

"State" shall mean the State of California.

"Transfer" shall mean to sell, assign, convey, lease, mortgage, or grant a security interest in, or where used as a noun, a sale, assignment, conveyance, or other disposition of any interest by operation of law or otherwise.

"United States" shall mean the United States of America and each department, agency, and instrumentality of the United States, including EPA.

"Waste Material" shall mean (a) any "hazardous substance" under Section 101(14) of CERCLA, 42 U.S.C. § 9601(14); (b) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. § 9601(33); (c) any "solid waste" under Section 1004(27) of RCRA, 42 U.S.C. § 6903(27); and (d) any "hazardous waste" under Title 22 of the California Code of Regulations, Section 66261.30.

"Work" shall mean all activities Respondents are required to perform under this Order, except those required by Section XV (Retention of Records).

IV. FINDINGS OF FACT

8. Montrose Chemical Corporation of California manufactured the pesticide dichlorodiphenyl-trichloroethane (DDT) at 20201 Normandie Avenue, Los Angeles County, California ("the Montrose Plant Property") from 1947 until the summer of 1982. Montrose ground technical grade DDT and conducted DDT formulation activities at the Montrose Plant Property. The Montrose Plant Property was the only location in the Torrance, California area where DDT grinding and DDT formulation were conducted.

9. During Montrose's operations at the Montrose Plant Property, DDT and other hazardous substances were released into the environment at and from the Montrose Plant Property in various ways, including through: leaks of technical grade DDT that was stored in improperly sealed or ripped bags on the Montrose Plant Property, generating visible dust around indoor and outdoor storage areas; vehicle traffic that tracked DDT dust into the ground; and wind that blew DDT dust out of the DDT grinding building. As much as one pound of technical grade DDT was carried to the outside air per shift from the DDT grinding building.

10. EPA has determined that DDT is a probable human carcinogen. DDT also exhibits non-cancer toxicity in the liver and nervous system. DDT is toxic to aquatic life and can cause reproductive failure in birds.

11. EPA placed the Montrose Chemical Superfund Site on the CERCLA National Priorities List in October 4, 1989, pursuant to CERCLA § 105, 42 U.S.C. § 9605.

12. The ECI Property occupies approximately 7.7 acres and is located southeast of the Montrose Plant Property along Normandie Avenue. The ECI Property is zoned commercial.

13. Seven residential properties are located along or proximate to the eastern boundary of the ECI Property. The ECI Property is separated from the residential properties by a wall.

14. The ECI Property is occupied by ECI, a registered hazardous waste transporter. ECI conducts operations at the ECI Property as part of its business as a hazardous waste transporter.

15. ECI is owned by Mr. Ronald J. Flury.

16. The ECI Property is owned by Mr. Ronald J. Flury.

17. Since the beginning of Montrose operations at the Montrose Plant Property until the early 1970's, a historical stormwater pathway existed that originated at the Montrose Plant Property. Stormwater runoff from the Montrose Plant Property flowed into a drainage ditch south of the Montrose Plant Property along Normandie Avenue. The stormwater pathway continued under Normandie Avenue and along a portion of 204th Street and then along the west side of Kenwood Avenue to Torrance Boulevard via an unimproved drainage ditch ("the Kenwood

Ditch"). The stormwater pathway continued under Torrance Boulevard, through the eastern portion of the ECI Property (as well as through portions of adjacent residential properties), and beyond.

18. In the late 1960's and early 1970's, Los Angeles County installed a storm drain ("Project 685") to convey stormwater replacing a portion of the historical stormwater pathway (including the Kenwood Ditch and the portion of the historical stormwater pathway at the ECI Property).

19. Flooding occurred between 1920 to 1965 through the historical stormwater pathway.

20. Prior to 1955, process wastewater (containing DDT) from DDT manufacturing operations at the Montrose Plant Property was occasionally released from the Montrose Plant Property. In February 1953, City of Los Angeles officials discovered ponded process wastewater from the Montrose Plant Property at the corner of 204th Street and Kenwood Avenue.

21. Concentrations of total DDT in soil at the Montrose Plant Property are present at levels in excess of 24,000 parts per million ("ppm"). DDT is also present at the Montrose Plant Property at levels (up to 710,000 ppm) consistent with the presence of spilled or discarded product, intermediates or off-specification technical or formulated DDT.

22. The maximum concentration, reported in the 1998 Remedial Investigation Report, of total DDT in the soil in the Normandie Avenue ditch south of the Montrose Plant Property is 8,600 ppm.

23. Maximum concentrations of total DDT were above 17 ppm (exposure point concentration corresponding to a 10^{-5} excess lifetime cancer risk) at 16 residential properties in the historical stormwater pathway along 204th Street and Kenwood Avenue and were above 170 ppm DDT (exposure point corresponding to a 10^{-4} excess lifetime cancer risk) at 6 of those properties. At 3 residential properties, a depositional white layer was discovered containing up to 10% DDT by weight. The soil containing these DDT levels was removed by EPA as part of the Kenwood Avenue Removal Action.

24. EPA has previously determined that the regional background DDT concentrations in Los Angeles County averaged between 1 and 3 ppm DDT, and ranged up to 10 ppm.

25. Soil sampling was conducted in 2005 at the ECI Property as part of site assessment activities commissioned by the property owner, Mr. Flury.

26. The maximum concentration of DDT found in the sampling conducted in 2005 by Mr. Flury was 325 ppm. The sample was taken in the area of the ECI Property where the historical stormwater pathway was located.

27. The upper range of the regional background DDT concentration, 10 ppm, was exceeded in 13% of the samples collected during the 2005 sampling; all samples exceeding 10 ppm of DDT were collected on the ECI Property in the area of the historical stormwater pathway.

28. In 2005, ECI excavated soils on the ECI Property around the historical stormwater pathway and stockpiled the soils on the ECI Property. In 2005, EPA ordered ECI, Mr. Flury and Montrose to address disposal of the excavated soil and to cover the open excavations. Under EPA's supervision, ECI transported the stockpiled soils to a permitted hazardous waste facility for thermal treatment and landfilling.

29. In 2006 and 2007, EPA performed soil investigations at the ECI Property. EPA found that the soils containing the heaviest concentrations of DDT on the ECI Property were adjacent to the historical stormwater pathway at 8 to 24 feet below ground surface. At least 20 percent of samples taken by EPA during this investigation contained DDT in excess of the background concentration of 10 ppm.

30. On February 3, 2014, ECI entered into a Voluntary Cleanup Agreement with DTSC to address hazardous substances on the ECI Property. On June 19, 2014, DTSC approved ECI's Removal Action Workplan, which contained ECI's plans to excavate, transport, and dispose of approximately 12,500 cubic yards of soil on the ECI Property.

31. In July 2015, ECI excavated approximately 8,000 cubic yards of soil contaminated with DDT from the eastern part of the ECI Property along the historical stormwater pathway.

32. The 8,000 cubic yards of excavated soil is stockpiled on the ECI Property. Prior to the excavation, this soil was buried under approximately 8 feet of fill material.

33. Residents around the ECI Property may be exposed to DDT through dust generation from the soil stockpiles and dust generation by vehicle traffic near the stockpiles. The primary exposure pathway is ingestion when a person brings hands to mouth after contact with contaminated soils or dust. Another exposure pathway is ingestion through inhaling contaminated dust, when the dust trapped in the mucosa is swallowed.

34. The National Oceanic and Atmospheric Administration forecasts that Santa Ana conditions will bring gusty winds to parts of the Los Angeles area starting October 29, 2015 and slight chance of showers starting November 2, 2014.

35. Hazardous substances at or near the surface of the soil stockpiles, including DDT, may migrate due to high winds or runoff from rainfall.

V. CONCLUSIONS OF LAW AND DETERMINATIONS

36. Based on the Findings of Fact set forth above, and the administrative record, EPA has determined that:

a. The ECI Property is a "facility" as defined by Section 101(9) of CERCLA, 42 U.S.C. § 9601(9).

b. Each Respondent is a "person" as defined by Section 101(21) of CERCLA, 42 U.S.C. § 9601(21).

c. Each Respondent is a liable party under one or more provisions of Section 107(a) of CERCLA, 42 U.S.C. § 9607(a).

(1) Respondents ECI and Mr. Ronald J. Flury are the "owner(s)" and/or "operator(s)" of the facility, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the meaning of Section 107(a)(1) of CERCLA, 42 U.S.C. § 9607(a)(1).

(2) Respondents Montrose, ECI and Mr. Ronald J. Flury were the "owners" and/or "operators" of the facility at the time of disposal of hazardous substances at the facility, as defined by Section 101(20) of CERCLA, 42 U.S.C. § 9601(20), and within the meaning of Section 107(a)(2) of CERCLA, 42 U.S.C. § 9607(a)(2).

(3) Respondents ECI and Mr. Ronald J. Flury arranged for disposal or treatment, or arranged with a transporter for transport for disposal or treatment of hazardous substances at the facility, within the meaning of Section 107(a)(3) of CERCLA, 42 U.S.C. § 9607(a)(3).

d. The contamination, as identified in the Findings of Fact above, includes a "hazardous substance" as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14), and also includes "pollutants or contaminants" that may present an imminent and substantial danger to public health or welfare under Section 104(a)(1) of CERCLA, 42 U.S.C. § 9604(a)(1)].

e. The conditions described in Paragraphs 8-35 of the Findings of Fact above constitute an actual and/or threatened "release" of a hazardous substance from the facility as defined by Section 101(22) of CERCLA, 42 U.S.C.§ 9601(22).

f. The conditions at the Site may constitute a threat to public health or welfare or the environment, based on the factors set forth in Section 300.415(b)(2) of the NCP. These factors include, but are not limited to, the following:

(1) actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances; this factor is present at the ECI Property due to the existence of DDT-contaminated stockpiles of soils that may blow into nearby residential yards and be ingested or inhaled by nearby residents;

(2) high levels of hazardous substances in soils largely at or near the surface, that may migrate; this factor is present at the ECI Property due to the existence of DDT contamination throughout the soil stockpiles;

(3) weather conditions that may cause hazardous substances to migrate or be released; this factor is present at the ECI Property due to the existence of high winds or runoff from rainfall;

(4) the unavailability of other appropriate federal or state response mechanisms to respond to the release; this factor supports the actions required by this Order at the ECI Property because DTSC requested that EPA act as the primary response agency.

g. The conditions described in Paragraphs 31-35 of the Findings of Fact above may constitute an imminent and substantial endangerment to the public health or welfare or the environment because of an actual or threatened release of a hazardous substance from the facility within the meaning of Section 106(a) of CERCLA, 42 U.S.C. § 9606(a). The removal actions required by this Order are necessary to protect the public health, welfare, or the environment.

VI. ORDER

37. Based upon the Findings of Fact and the Conclusions of Law and Determinations set forth above, Respondents are hereby ordered to comply with all provisions of this Order and any modifications to this Order, including all appendices to this Order and all documents incorporated by reference into this Order.

VII. OPPORTUNITY TO CONFER

38. Within three days after this Order is signed by the Regional Administrator or his/her delegatee, Respondents may, in writing, request a conference with EPA to discuss this Order, including its applicability, the factual findings and the determinations upon which it is based, the appropriateness of any actions Respondents are ordered to take, or any other relevant and material issues or contentions that Respondents may have regarding this Order.

39. Respondents may appear in person or by an attorney or other representative at the conference. Any such conference shall be held at least two days after the conference is requested. Respondents may also submit written comments or statements of position on any matter pertinent to this Order no later than one day after the conference or within three days after this Order is signed if Respondents do not request a conference. This conference is not an evidentiary hearing, does not constitute a proceeding to challenge this Order, and does not give Respondents a right to seek review of this Order. Any request for a conference or written comments or statements should be submitted to:

Xiao Zhang, Office of Regional Counsel
U.S. Environmental Protection Agency, Region IX
75 Hawthorne St.
San Francisco, CA 94105
(415) 972-3266
Zhang.xiao@epa.gov

VIII. EFFECTIVE DATE

40. With respect to the work required in Paragraphs 46.a through 46.c of this Order, this Order shall be effective on the date the Order is signed by EPA. With respect all portions of this Order except Paragraphs 46.a through 46.c, this Order shall be effective five days after the Order is signed by EPA ("Effective Date") unless a conference is requested or written materials are submitted in accordance with Section VII (Opportunity to Confer). If a conference is requested or written materials are submitted, this Order shall be effective on the later of the 2nd day after the day of the conference, or the second day after written materials, if any, are submitted, unless EPA determines that the Order should be modified based on the conference or

written materials. In such event, EPA shall notify Respondents, within the two day period, that EPA intends to modify the Order. The modified Order shall be effective two days after it is signed by EPA.

IX. NOTICE OF INTENT TO COMPLY

41. Within 24 hours of each Respondent's receipt of this order, each Respondent shall notify EPA in writing of Respondent's irrevocable intent to comply with the work required in Paragraphs 46.a through 46.c. On or before the Effective Date, each Respondent shall notify EPA in writing of Respondent's irrevocable intent to comply with all portions of this Order except Paragraphs 46.a through 46.c. Such written notice shall be sent to EPA as provided in Paragraph 39. Each Respondent's written notice shall describe, using facts that exist on or prior to the Effective Date, any "sufficient cause" defense asserted by such Respondent under Sections 106(b) and 107(c)(3) of CERCLA, 42 U.S.C. §§ 9606(b) and 9607(c)(3). The absence of a response by EPA to the notice required by this Paragraph shall not be deemed acceptance of any Respondent's assertions. Failure of any Respondent to provide such notification within this time period shall, as of the Effective Date, be treated as a violation of this Order by such Respondent.

X. DESIGNATION OF CONTRACTOR, PROJECT COORDINATOR, AND ON-SCENE COORDINATOR

42. Selection of Contractors, Personnel. All Work performed under this Order shall be under the direction and supervision of qualified personnel. Within three (3) days after the Effective Date, and before the Work outlined below begins, Respondents shall notify EPA in writing of the names, titles, and qualifications of the personnel, including contractors, subcontractors, consultants, and laboratories to be used in carrying out such Work. If, after the commencement of the Work, Respondents retain additional contractor(s) or subcontractor(s), Respondents shall notify EPA of the name(s) and qualification(s) of such contractor(s) or subcontractor(s) retained to perform the Work at least two days prior to commencement of Work by such additional contractor(s) or subcontractor(s). EPA retains the right, at any time, to disapprove of any or all of the contractors and/or subcontractors retained by Respondents. If EPA disapproves of a selected contractor or subcontractor, Respondents shall retain a different contractor or subcontractor and shall notify EPA of that contractor's or subcontractor's name and qualifications within five days after EPA's disapproval. With respect to any proposed contractor, Respondents shall demonstrate that the proposed contractor demonstrates compliance with ASQ/ANSI E4:2014 "Quality management systems for environmental information and technology programs – Requirements with guidance for use" (American Society for Quality, February 2014), by submitting a copy of the proposed contractor's Quality Management Plan (QMP). The QMP should be prepared in accordance with "EPA Requirements for Quality Management Plans (QA/R-2)" (EPA/240/B-01/002, Reissued May 2006) or equivalent documentation as determined by EPA. The qualifications of the persons undertaking the Work for Respondents shall be subject to EPA's review for verification that such persons meet minimum technical background and experience requirements.

43. Within two days after the Effective Date, Respondents shall designate a Project Coordinator who shall be responsible for administration of the Work required by this Order and responding to questions from the public regarding the Work required by this Order, and shall

submit to EPA the designated Project Coordinator's name, address, telephone number, email address, and qualifications. To the greatest extent possible, the Project Coordinator shall be present on Site or readily available during the Work. EPA retains the right to disapprove of the designated Project Coordinator. If EPA disapproves of the designated Project Coordinator, Respondents shall retain a different Project Coordinator and shall notify EPA of that person's name, address, telephone number, email address, and qualifications within 2 days following EPA's disapproval. Within one day following EPA's approval of the Project Coordinator, Respondents shall post notices at the ECI Property identifying the Project Coordinator as the contact person for any inquiries regarding the Work required by this Order, with the contact information for the Project Coordinator, so that the notices are visible and accessible to the public. Respondents shall ensure that such notices contain accurate current information. Respondents shall have the right to change their Project Coordinator, subject to EPA's right to disapprove. Respondents shall notify EPA two days before such a change is made. The initial notification may be made orally, but shall be promptly followed by a written notification. Communications between Respondents and EPA, and all documents concerning the activities performed pursuant to this Order, shall be directed to the Project Coordinator. Receipt by Respondents' Project Coordinator of any notice or communication from EPA relating to this Order shall constitute receipt by all Respondents.

44. EPA has designated Anhtu Nguyen of the Superfund Division, EPA Region IX, as its Remedial Project Manager (RPM). EPA will notify Respondents of a change of its designated RPM. Communications between Respondents and EPA, and all documents concerning the activities performed pursuant to this Order, shall be directed to the RPM in accordance with Paragraph 49.a(1).

45. The RPM shall be responsible for overseeing Respondents' implementation of this Order. The RPM shall have the authority vested in an RPM and an On-Scene Coordinator (OSC) by the NCP, including the authority to halt, conduct, or direct any Work required by this Order, or to direct any other response action when he determines that conditions at the Site constitute an emergency situation or may present a threat to public health or welfare or the environment. Absence of the RPM from the Site shall not be cause for stoppage or delay of Work.

XI. WORK TO BE PERFORMED

46. Respondents shall perform the following actions:

a. Secure and manage the soil stockpiles so as to prevent releases from wind erosion or direct contact by ensuring the soil stockpiles are completely covered with plastic at all times, isolating the project area from vehicle traffic to ensure soil from the stockpiles is not tracked off-site, and inspecting the soil stockpiles daily to ensure the plastic covers are intact.

b. Within two days after this Order is signed by EPA, retain an independent contractor to take daily photographs documenting the soil stockpiles, the excavation pit, and the wall along the eastern border of the ECI Property. These photographs shall be time- and date-stamped and submitted daily to the RPM by electronic mail by 6 p.m. Pacific Time, starting from two days after this Order is signed by EPA until the soil stockpiles are disposed, unless otherwise directed in writing by the RPM. These photographs shall also include any portions of the soil stockpiles, excavation area, and eastern wall on the ECI Property that are not being managed in accordance with Paragraph 46.a of this Order or with any EPA-approved workplan; such photographs shall be accompanied by an explanation for the noncompliance and the actions and timeline for addressing the noncompliance. In the event of rain, the submission to the RPM shall also contain photographs of any runoff from the soil stockpiles and a narrative description of the extent of the runoff.

c. Within ten days after this Order is signed by EPA, submit to the RPM a waste determination for the excavated soil stockpiled on the ECI Property.

d. Develop a workplan for management of the soil stockpiles prior to disposal to prevent further releases, including for placing soil erosion barriers around the base of the stockpiles and keeping the asphalt areas clear of residual soils.

e. Develop a workplan for stabilizing the wall on the eastern side of the ECI Property along and proximate to residential areas.

f. Retain a licensed professional engineer to assess and write a report on the impacts resulting from ECI's July 2015 excavation, including impacts on the homes adjacent to the eastern side of the ECI Property.

47. For any regulation or guidance referenced in the Order, the reference will be read to include any subsequent modification, amendment, or replacement of such regulation or guidance. Such modifications, amendments, or replacements apply to the Work only after Respondents receive notification from EPA of the modification, amendment, or replacement.

48. Work Plan and Implementation.

a. Within five days after the Effective Date, in accordance with Paragraph 49 (Submission of Deliverables), Respondents shall submit to EPA for review and approval a draft work plan for performing the removal actions (the "Work Plan") generally described in Paragraphs 46.d through 46.f above. The draft Work Plan shall provide a description of, and an expeditious schedule for, the work required in Paragraphs 46.d through 46.f of this Order. The Work Plan shall provide for stabilizing the wall along the eastern side of the ECI Property within ten days of EPA's approval of the Work Plan.

b. EPA may approve, disapprove, require revisions to, or modify the draft Work Plan in whole or in part. If EPA requires revisions, Respondents shall submit a revised draft Work Plan within two days after receipt of EPA's notification of the required revisions. Respondents shall implement the Work Plan as approved in writing by EPA in accordance with the schedule approved by EPA. Once approved, or approved with modifications, the Work Plan, the schedule, and any subsequent modifications shall be incorporated into and become fully enforceable under this Order.

c. Upon approval or approval with modifications of the Work Plan Respondents shall commence implementation of the Work in accordance with the schedule included therein. Respondents shall not commence or perform any Work except in conformance with the terms of this Order. Respondents shall notify EPA at least 48 hours prior to performing any Work on-Site pursuant to the EPA-approved Work Plan.

d. Unless otherwise provided in this Order, any additional deliverables that require EPA approval under the Work Plan shall be reviewed and approved by EPA in accordance with this Paragraph.

e. Any non-compliance with any EPA-approved plans, reports, specifications, schedules, or other deliverables shall be considered a violation of the requirements of this Order. Determinations of non-compliance shall be made by EPA. Approval of the Work Plan shall not limit EPA's authority under the terms of this Order to require Respondents to conduct activities consistent with this Order to accomplish the Work outlined in this Section.

49. Submission of Deliverables

a. General Requirements for Deliverables.

(1) Except as otherwise provided in this Order, Respondents shall direct all submissions required by this Order to the RPM at

Anhtu Nguyen
Remedial Project Manager
U.S. Environmental Protection Agency
Superfund Division (SFD-7-2)
75 Hawthorne Street
San Francisco, CA 94105
(415) 972-3443
Nguyen.anhtu@epa.gov

Respondents shall submit all deliverables required by this Order or any approved work plan to EPA in accordance with the schedule set forth in such plan.

(2) Respondents shall submit all deliverables in electronic form. All deliverables shall be submitted to EPA in the form specified by the RPM. If any deliverable includes maps, drawings, or other exhibits that are larger than 8.5 x 11 inches, Respondents shall also provide EPA with paper copies of such exhibits. Respondents shall submit all deliverables in electronic form. Technical specifications for sampling and monitoring data and spatial data are addressed in Paragraph 49.b All other deliverables shall be submitted to EPA in the form specified by the RPM. If any deliverable includes maps, drawings, or other exhibits that are larger than 8.5 x 11 inches, Respondents shall also provide EPA with paper copies of such exhibits.

b. Technical Specifications for Deliverables.

(1) Sampling and monitoring data should be submitted in standard Regional EDD format. Other delivery methods may be allowed if electronic direct submission presents a significant burden or as technology changes.

(2) Spatial data, including spatially-referenced data and geospatial data, should be submitted: (a) in the ESRI File Geodatabase format; and (b) as unprojected geographic coordinates in decimal degree format using North American Datum 1983 (NAD83) or World Geodetic System 1984 (WGS84) as the datum. If applicable, submissions should include the collection method(s). Projected coordinates may optionally be included but must be documented. Spatial data should be accompanied by metadata, and such metadata should be compliant with the Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata and its EPA profile, the EPA Geospatial Metadata Technical Specification. An add-on metadata editor for ESRI software, the EPA Metadata Editor (EME), complies with these FGDC and EPA metadata requirements and is available at https://edg.epa.gov/EME/.

(3) Each file must include an attribute name for each site unit or sub-unit submitted. Consult http://www.epa.gov/geospatial/policies.html for any further available guidance on attribute identification and naming.

(4) Spatial data submitted by Respondents does not, and is not intended to, define the boundaries of the Site.

50. Sampling and Analysis Plan. Within five days after the Effective Date, Respondents shall submit any Sampling and Analysis Plan required to comply with the work required in this Order to EPA for review and approval. This plan shall consist of a Field Sampling Plan (FSP) and a Quality Assurance Project Plan (QAPP) that is consistent with the NCP and applicable guidance documents, including, but not limited to, "Guidance for Quality Assurance Project Plans (QA/G-5)" EPA/240/R-02/009 (December 2002), "EPA Requirements for Quality Assurance Project Plans (QA/R-5)" EPA 240/B-01/003 (March 2001, reissued May 2006), and "Uniform Federal Policy for Quality Assurance Project Plans, Parts 1-3 EPA/505/B-04/900A-900C (March 2005). Upon its approval by EPA, the Sampling and Analysis Plan shall be incorporated into and become enforceable under this Order.

51. Health and Safety Plan. Within five days after the Effective Date, Respondents shall submit for EPA review and comment a Health and Safety Plan that ensures the protection of on-site workers and the public during performance of on-site Work under this Order. This plan shall be prepared in accordance with "OSWER Integrated Health and Safety Program Operating Practices for OSWER Field Activities," Pub. 9285.0-OlC (Nov. 2002), available on the NSCEP database at http://www.epa.gov/nscep/index.html, and "EPA's Emergency Responder Health and Safety Manual," OSWER Directive 9285.3-12 (July 2005 and updates), available at http://www.epaosc.org/_HealthSafetyManual/manual-index.htm. In addition, the plan shall comply with all currently applicable Occupational Safety and Health Administration (OSHA) regulations found at 29 C.F.R. Part 1910. If EPA determines that it is appropriate, the plan shall also include contingency planning. Respondents shall incorporate all changes to the plan recommended by EPA and shall implement the plan during the pendency of the removal actions.

52. Progress Reports. Respondents shall submit a written progress report to EPA concerning actions undertaken pursuant to this Order on a weekly basis, or as otherwise requested by EPA, from the date of receipt of EPA's approval of the Removal Work Plan until issuance of Notice of Completion of Work pursuant to Section XXVI, unless otherwise directed in writing by the RPM. These reports shall describe all significant developments during the preceding period, including the actions performed and any problems encountered, analytical data received during the reporting period, and the developments anticipated during the next reporting period, including a schedule of actions to be performed, anticipated problems, and planned resolutions of past or anticipated problems.

53. Final Report. Within ten days after completion of all Work required by this Order, with the exception of any continuing obligations required by this Order, including reimbursement of any EPA Response Costs and Retention of Records, Respondents shall submit for EPA review and approval a final report summarizing the actions taken to comply with this Order. EPA will review and approve the final report in accordance with Section XXVI (Notice of Completion of Work). The final report shall conform, at a minimum, with the requirements set forth in Section 300.165 of the NCP, "OSC Reports." The final report shall include a good faith estimate of total costs or a statement of actual costs incurred in complying with the Order, a listing of quantities and types of materials removed off-Site or handled on-Site, a discussion of removal and disposal options considered for those materials, a listing of the ultimate destination(s) of those materials, a presentation of the analytical results of all sampling and analyses performed, and accompanying appendices containing all relevant documentation generated during the removal actions (e.g., manifests, invoices, bills, contracts, and permits). The final report shall also include the following certification signed by a responsible corporate official of a Respondent or Respondent's Project Coordinator: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

XII. QUALITY ASSURANCE, SAMPLING, AND DATA ANALYSIS

54. Respondents shall use quality assurance, quality control, and other technical activities and chain of custody procedures for all samples consistent with "EPA Requirements for Quality Assurance Project Plans (QA/R5)," EPA/240/B-01/003 (March 2001, reissued May 2006), "Guidance for Quality Assurance Project Plans (QA/G-5)," EPA/240/R-02/009 (December 2002), and "Uniform Federal Policy for Quality Assurance Project Plans," Parts 1-3, EPA/505/B-04/900A-900C (March 2005).

55. Access to Laboratories.

a. Respondents shall ensure that EPA personnel and its authorized representatives are allowed access at reasonable times to all laboratories utilized by Respondents pursuant to this Order. In addition, Respondents shall ensure that such laboratories shall analyze all samples submitted by EPA pursuant to the QAPP for quality assurance, quality control, and technical activities that will satisfy the stated performance criteria as specified in the QAPP and that sampling and field activities are conducted in accordance with EPA's "Field Operations Group Operational Guidelines for Field Activities" (http://www.epa.gov/region8/qa/FieldOperationsGroupOperationalGuidelinesForFieldActivities.pdf) and "EPA QA Field Activities Procedure" (http://www.epa.gov/irmpoli8/policies/2105-p-02.pdf). Respondents shall ensure that the laboratories they utilize for the analysis of samples taken pursuant to this Order meet the competency requirements set forth in EPA's "Policy to Assure Competency of Laboratories, Field Sampling, and Other Organizations Generating Environmental Measurement Data under Agency-Funded Acquisitions" (http://www.epa.gov/fem/pdfs/fem-lab-competency-policy.pdf) and that the laboratories perform all analyses using EPA-accepted methods. Accepted EPA methods consist of, but are not limited to, methods that are documented in the EPA's Contract Laboratory Program (http://www.epa.gov/superfund/programs/clp/), SW 846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (http://www.epa.gov/epawaste/hazard/testmethods/sw846/online/index.htm), "Standard Methods for the Examination of Water and Wastewater" (http://www.standardmethods.org/), 40 C.F.R. Part 136, "Air Toxics - Monitoring Methods" (http://www.epa.gov/ttnamti1/airtox.html)." However, upon approval by EPA [, after a reasonable opportunity for review and comment by the State], Respondents may use other appropriate analytical method(s), as long as (i) quality assurance/quality control (QA/QC) criteria are contained in the method(s) and the method(s) are included in the QAPP, (ii) the analytical method(s) are at least as stringent as the methods listed above, and (iii) the method(s) have been approved for use by a nationally recognized organization responsible for verification and publication of analytical methods, e.g., EPA, ASTM, NIOSH, OSHA, etc. Respondents shall ensure that all laboratories they use for analysis of samples taken pursuant to this Order have a documented Quality System that complies with ASQ/ANSI E4:2014 "Quality management systems for environmental information and technology programs – Requirements with guidance for use" (American Society for Quality, February 2014), and "EPA Requirements for Quality Management Plans (QA/R-2)" EPA/240/B-01/002 (March 2001, reissued May 2006), or equivalent documentation as determined by EPA. EPA may consider Environmental Response Laboratory Network (ERLN) laboratories, laboratories accredited under the National Environmental Laboratory Accreditation Program (NELAP), or laboratories that meet International Standardization Organization (ISO 17025) standards or other nationally recognized programs (http://www.epa.gov/fem/accredit.htm) as meeting the Quality System requirements. Respondents shall ensure that all field methodologies utilized in collecting samples for subsequent analysis pursuant to this Order are conducted in accordance with the procedures set forth in the QAPP approved by EPA.

b. Upon request, Respondents shall provide split or duplicate samples to EPA or its authorized representatives. Respondents shall notify EPA not less than two days in advance of any sample collection activity. In addition, EPA shall have the right to take any additional samples that EPA deems necessary. Upon request, EPA shall provide to Respondents split or duplicate samples of any samples it takes as part of EPA's oversight of Respondents' implementation of the Work.

c. Respondents shall submit to EPA, in the next monthly progress report as described in Paragraph 52 (Progress Reports) copies of the results of all sampling and/or tests or other data obtained or generated by or on behalf of Respondents with respect to the Site and/or the implementation of this Order.

XIII. PROPERTY REQUIREMENTS

56. Agreements Regarding Access and Non-Interference. Respondents shall, with respect to any Respondent Owner's Affected Property, use best efforts to secure from such Respondent Owner an agreement, enforceable by Respondents and EPA, providing that such Respondent Owner shall: (i) provide EPA, Respondents, and their representatives, contractors, and subcontractors with access at all reasonable times to such Affected Property to conduct any activity regarding the Order, including those activities listed in Paragraph 56.a (Access Requirements); and (ii) refrain from using such Affected Property in any manner that EPA determines will pose an unacceptable risk to human health or to the environment due to exposure to Waste Material, or interfere with or adversely affect the implementation, integrity, or protectiveness of the removal action.

a. Access Requirements. The following is a list of activities for which access is required regarding the Affected Property:

(1) Monitoring the Work;

(2) Verifying any data or information submitted to EPA;

(3) Conducting investigations regarding contamination at or near the Site;

(4) Obtaining samples;

(5) Assessing the need for, planning, implementing, or monitoring response actions;

(6) Implementing the Work pursuant to the conditions set forth in Section XIX (Enforcement/Work Takeover);

(7) Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by Respondents or their agents, consistent with Section XIV (Access to Information);

(8) Assessing Respondents' compliance with the Order;

(9) Determining whether the Affected Property is being used in a manner that is prohibited or restricted, or that may need to be prohibited or restricted under the Order; and

(10) Implementing, monitoring, maintaining, reporting on, and enforcing any land, water, or other resource use restrictions regarding the Affected Property.

57. Best Efforts. As used in this Section, "best efforts" means the efforts that a reasonable person in the position of Respondents would use so as to achieve the goal in a timely manner, including the cost of employing professional assistance and the payment of reasonable sums of money to secure access and/or use restriction agreements, as required by this Section. If, within three days after the Effective Date, Respondents are unable to accomplish what is required through "best efforts" they shall notify EPA, and include a description of the steps taken to comply with the requirements. If EPA deems it appropriate, it may assist Respondents or take independent action in obtaining such access and/or use restrictions. EPA reserves the right to seek payment from Respondents for all costs, including cost of attorneys' time, incurred by the United States in obtaining such access or agreements to restrict land, water, or other resource use.

58. Owner Respondent shall not Transfer the ECI Property unless it has first secured EPA's approval of, and transferee's consent to, an agreement that: (i) is enforceable by EPA; and (ii) requires the transferee to provide access to and refrain from using the ECI Property to the same extent as is provided under Paragraphs 566.a (Access Requirements).

59. If EPA determines in a decision document prepared in accordance with the NCP that institutional controls in the form of state or local laws, regulations, ordinances, zoning restrictions, or other governmental controls or notices are needed, Respondents shall cooperate with EPA's efforts to secure and ensure compliance with such institutional controls.

60. In the event of any Transfer of the ECI Property, unless EPA otherwise consents in writing, Respondents shall continue to comply with their obligations under this Order, including their obligation to secure access and ensure compliance with any land, water, or other resource use restrictions regarding the ECI Property.

61. Notwithstanding any provision of this Order, EPA retains all of its access authorities and rights, as well as all of its rights to require land, water, or other resource use restrictions, including enforcement authorities related thereto under CERCLA, RCRA, and any other applicable statute or regulations.

XIV. ACCESS TO INFORMATION

62. Respondents shall provide to EPA , upon request, copies of all records, reports, documents, and other information (including records, reports, documents, and other information in electronic form) (hereinafter referred to as "Records") within Respondents' possession or control or that of their contractors or agents relating to activities at the Site or to the implementation of this Order, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information regarding the Work. Respondents shall also make available to EPA, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work.

63. Privileged and Protected Claims.

a. Respondents may assert that all or part of a Record requested by EPA is privileged or protected as provided under federal law, in lieu of providing the Record, provided Respondents comply with Paragraph 63.b, and except as provided in Paragraph 63.c.

b. If Respondents assert a claim of privilege or protection, they shall provide EPA with the following information regarding such Record: its title; its date; the name, title, affiliation (e.g., company or firm), and address of the author, of each addressee, and of each recipient; a description of the Record's contents; and the privilege or protection asserted. If a claim of privilege or protection applies only to a portion of a Record, Respondents shall provide the Record to EPA in redacted form to mask the privileged or protected portion only. Respondents shall retain all Records that they claim to be privileged or protected until EPA has had a reasonable opportunity to dispute the privilege or protection claim and any such dispute has been resolved in Respondents' favor.

c. Respondents may make no claim of privilege or protection regarding: (1) any data regarding the Site, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, radiological, or engineering data, or the portion of any other Record that evidences conditions at or around the Site; or (2) the portion of any Record that Respondents are required to create or generate pursuant to this Order.

64. Business Confidential Claims. Respondents may assert that all or part of a Record provided to EPA under this Section or Section XV (Retention of Records) is business confidential to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. § 9604(e)(7), and 40 C.F.R. § 2.203(b). Respondents shall segregate and clearly identify all Records or parts thereof submitted under this UAO for which Respondents assert business confidentiality claims. Records submitted to EPA determined to be confidential by EPA will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies Records when they are submitted to EPA, or if EPA has notified Respondents that the Records are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2, Subpart B, the public may be given access to such Records without further notice to Respondents.

65. Notwithstanding any provision of this Order, EPA retains all of its information gathering and inspection authorities and rights, including enforcement actions related thereto, under CERCLA, RCRA, and any other applicable statutes or regulations.

XV. RETENTION OF RECORDS

66. During the pendency of this Order and for a minimum of ten years after Respondents' receipt of EPA's notification pursuant to Section XXVI (Notice of Completion of Work), each Respondent shall preserve and retain all non-identical copies of Records (including Records in electronic form) now in its possession or control, or that come into its possession or control, that relate in any manner to its liability under CERCLA with respect to the Site, provided, however, that Respondents who are potentially liable as owners or operators of the Site must retain, in addition, all Records that relate to the liability of any other person under

CERCLA with respect to the Site. Each Respondent must also retain, and instruct its contractors and agents to preserve, for the same period of time specified above, all non-identical copies of the last draft or final version of any Records (including Records in electronic form) now in its possession or control or that come into its possession or control that relate in any manner to the performance of the Work, provided, however, that each Respondent (and its contractors and agents) must retain, in addition, copies of all data generated during performance of the Work and not contained in the aforementioned Records required to be retained. Each of the above record retention requirements shall apply regardless of any corporate retention policy to the contrary.

67. At the conclusion of this document retention period, Respondents shall notify EPA at least 90 days prior to the destruction of any such Records, and, upon request by EPA, and except as provided in Paragraph 63, Respondents shall deliver any such Records to EPA.

68. Within ten days after the Effective Date, each Respondent shall submit a written certification to EPA's RPM that, to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed, or otherwise disposed of any Records (other than identical copies) relating to its potential liability regarding the Site since notification of its potential liability by the United States, and that it has fully complied with any and all EPA requests for information regarding the Site pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. §§ 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. § 6927. Any Respondent unable to so certify shall submit a modified certification that explains in detail why it is unable to certify in full with regard to all Records.

XVI. COMPLIANCE WITH OTHER LAWS

69. Nothing in this Order limits Respondent's obligations to comply with the requirements of all applicable state and federal laws and regulations, except as provided in Section 121(e) of CERCLA, 42 U.S.C. § 6921(e), and 40 C.F.R. §§ 300.400(e) and 300.415(j). In accordance with 40 C.F.R. § 300.415(j), all on-site actions required pursuant to this Order shall, to the extent practicable, as determined by EPA, considering the exigencies of the situation, attain applicable or relevant and appropriate requirements (ARARs) under federal environmental or state environmental or facility siting laws. Respondents shall identify ARARs in the Work Plan subject to EPA approval.

70. No local, state, or federal permit shall be required for any portion of the Work conducted entirely on-site (i.e., within the areal extent of contamination or in very close proximity to the contamination and necessary for implementation of the Work), including studies, if the action is selected and carried out in compliance with Section 121 of CERCLA, 42 U.S.C. § 9621. Where any portion of the Work that is not on-site requires a federal or state permit or approval, Respondents shall submit timely and complete applications and take all other actions necessary to obtain and to comply with all such permits or approvals. This Order is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.

XVII. EMERGENCY RESPONSE AND NOTIFICATION OF RELEASES

71. Emergency Response. If any event occurs during performance of the Work that causes or threatens to cause a release of any Waste Material on, at, or from the Site that either constitutes an emergency situation or that may present an immediate threat to public health or welfare or the environment, Respondents shall immediately take all appropriate action to prevent, abate, or minimize such release or threat of release. Respondents shall take these actions in accordance with all applicable provisions of this Order, including, but not limited to, the Health and Safety Plan. Respondents shall also immediately notify the RPM or, in the event of his/her unavailability, the Regional Duty Officer at 800-300-2193 of the incident or Site conditions. In the event that Respondents fail to take appropriate response action as required by this Paragraph, and EPA takes such action instead, EPA reserves the right to pursue cost recovery.

72. Release Reporting. Upon the occurrence of any event during performance of the Work that Respondents are required to report pursuant to Section 103 of CERCLA, 42 U.S.C. § 9603, or Section 304 of the Emergency Planning and Community Right-To-Know Act (EPCRA), 42 U.S.C. § 11004, Respondents shall immediately orally notify the RPM, or, in the event of his/her unavailability, the Regional Duty Officer at 800-300-2193, and the National Response Center at (800) 424-8802. This reporting requirement is in addition to, and not in lieu of, the reporting required by CERCLA § 103 or EPCRA § 304.

73. For any event covered under this Section, Respondents shall submit a written report to EPA within seven days after the onset of such event, setting forth the action or event that occurred and the measures taken, and to be taken, to mitigate any release or threat of release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release or threat of release.

XVIII. PAYMENT OF RESPONSE COSTS

74. Upon EPA's written demand, Respondents shall pay EPA all Response Costs incurred or to be incurred in connection with this Order. On a periodic basis, EPA will send Respondents a bill requiring payment of all Response Costs incurred by the United States with respect to this Order that includes a cost summary, which includes direct and indirect costs incurred by EPA, its contractors, and the Department of Justice.

75. Respondents shall make all payments within 30 days after receipt of each written demand requiring payment. Payment shall be made to EPA by Fedwire Electronic Funds Transfer (EFT) to:

Federal Reserve Bank of New York
ABA = 021030004
Account = 68010727
SWIFT address = FRNYUS33
33 Liberty Street
New York NY 10045

Field Tag 4200 of the Fedwire message should read "D 68010727 Environmental Protection Agency"

and shall reference Site/Spill ID Number 0926 and the EPA docket number for this action.

76. At the time of payment, Respondents shall send notice that payment has been made to Anhtu Nguyen, EPA Region 9, 75 Hawthorne St., San Francisco, CA 94105, Nguyen.anhtu@epa.gov; and to the EPA Cincinnati Finance Office by email at cinwd_acctsreceivable@epa.gov, or by mail to

EPA Cincinnati Finance Office
26 W. Martin Luther King Drive
Cincinnati, Ohio 45268

Such notice shall reference Site/Spill ID Number 0926 and EPA docket number for this action.

77. In the event that the payments for Response Costs are not made within 30 days after Respondents' receipt of a written demand requiring payment, Respondents shall pay Interest on the unpaid balance. The Interest on Response Costs shall begin to accrue on the date of the written demand and shall continue to accrue until the date of payment. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to the United States by virtue of Respondents' failure to make timely payments under this Section. Respondents shall make all payments required by this Paragraph in the manner described in Paragraphs 75 and 76.

XIX. ENFORCEMENT/WORK TAKEOVER

78. Any willful violation, or failure or refusal to comply with any provision of this Order may subject Respondents to civil penalties of up to $37,500 per violation per day, as provided in Section 106(b)(1) of CERCLA, 42 U.S.C. § 9606(b)(1), and the Civil Monetary Penalty Inflation Adjustment Rule, 40 C.F.R. Part 19. In the event of such willful violation, or failure or refusal to comply, EPA may carry out the required actions unilaterally, pursuant to Section 104 of CERCLA, 42 U.S.C. § 9604, and/or may seek judicial enforcement of this Order pursuant to Section 106 of CERCLA, 42 U.S.C. § 9606. Respondents may also be subject to punitive damages in an amount up to three times the amount of any costs incurred by the United States as a result of such failure to comply, as provided in Section 107(c)(3) of CERCLA, 42 U.S.C. § 9607(c)(3).

XX. RESERVATIONS OF RIGHTS BY EPA

79. Nothing in this Order shall limit the power and authority of EPA or the United States to take, direct, or order all actions necessary to protect public health, welfare, or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants, or contaminants, or hazardous or solid waste on, at, or from the Site. Further, nothing in this Order shall prevent EPA from seeking legal or equitable relief to enforce the terms of this Order, from taking other legal or equitable action as it deems appropriate and necessary, or from requiring Respondents in the future to perform additional activities pursuant to CERCLA or any other applicable law. EPA reserves the right to bring an action against

Respondents under Section 107 of CERCLA, 42 U.S.C. § 9607, for recovery of any response costs incurred by the United States related to this Order or the Site and not paid by Respondents.

XXI. OTHER CLAIMS

80. By issuance of this Order, the United States and EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondents. The United States or EPA shall not be deemed a party to any contract entered into by Respondents or their directors, officers, employees, agents, successors, representatives, assigns, contractors, or consultants in carrying out actions pursuant to this Order.

81. Nothing in this Order constitutes a satisfaction of or release from any claim or cause of action against Respondents or any person not a party to this Order, for any liability such person may have under CERCLA, other statutes, or common law, including but not limited to any claims of the United States under Sections 106 and 107 of CERCLA, 42 U.S.C. §§ 9606 and 9607.

82. Nothing in this Order shall be deemed to constitute preauthorization of a claim within the meaning of Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2), or 40 C.F.R. § 300.700(d).

83. No action or decision by EPA pursuant to this Order shall give rise to any right to judicial review, except as set forth in Section 113(h) of CERCLA, 42 U.S.C. § 9613(h).

XXII. INSURANCE

84. No later than ten days before commencing any on-site Work, Respondents shall secure, and shall maintain for the duration of this Order, commercial general liability insurance with appropriate limits, for any one occurrence, and automobile insurance with appropriate limits, combined single limit, naming EPA as an additional insured with respect to all liability arising out of the activities performed by or on behalf of Respondents pursuant to this Order. Within the same time period, Respondents shall provide EPA with certificates of such insurance and a copy of each insurance policy. Respondents shall submit such certificate and copies of policies each year on the anniversary of the Effective Date. In addition, for the duration of the Order, Respondents shall satisfy, or shall ensure that their contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker's compensation insurance for all persons performing Work on behalf of Respondents in furtherance of this Order. If Respondents demonstrate by evidence satisfactory to EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering some or all of the same risks but in a lesser amount, then, with respect to that contractor or subcontractor, Respondents need provide only that portion of the insurance described above which is not maintained by such contractor or subcontractor.

XXIII. MODIFICATION

85. The RPM may make modifications to any plan or schedule in writing or by oral direction. Any oral modification will be memorialized in writing by EPA within five days, but shall have as its effective date the date of the RPM's oral direction. Any other requirements of

this Order may be modified in writing by signature of the Superfund Branch Chief of EPA Region IX.

86. If Respondents seek permission to deviate from any approved Work Plan or schedule, Respondents' Project Coordinator shall submit a written request to EPA for approval outlining the proposed modification and its basis. Respondents may not proceed with the requested deviation until receiving approval from the RPM pursuant to Paragraph 85.

87. No informal advice, guidance, suggestion, or comment by the RPM or other EPA representatives regarding reports, plans, specifications, schedules, or any other writing submitted by Respondents shall relieve Respondents of their obligation to obtain any formal approval required by this Order, or to comply with all requirements of this Order, unless it is formally modified.

XXIV. DELAY IN PERFORMANCE

88. Respondents shall notify EPA of any delay or anticipated delay in performing any requirement of this Order. Such notification shall be made by telephone and email to the RPM within 24 hours after Respondents first knew or should have known that a delay might occur. Respondents shall adopt all reasonable measures to avoid or minimize any such delay. Within 48 hours after notifying EPA by telephone and email, Respondents shall provide to EPA written notification fully describing the nature of the delay, the anticipated duration of the delay, any justification for the delay, all actions taken or to be taken to prevent or minimize the delay or the effect of the delay, a schedule for implementation of any measures to be taken to mitigate the effect of the delay, and any reason why Respondents should not be held strictly accountable for failing to comply with any relevant requirements of this Order. Increased costs or expenses associated with implementation of the activities called for in this Order is not a justification for any delay in performance.

89. Any delay in performance of this Order that, in EPA's judgment, is not properly justified by Respondents under the terms of Paragraph 88 shall be considered a violation of this Order. Any delay in performance of this Order shall not affect Respondents' obligations to fully perform all obligations under the terms and conditions of this Order.

XXV. ADDITIONAL REMOVAL ACTIONS

90. If EPA determines that additional removal actions not included in an approved plan are necessary to protect public health, welfare, or the environment, EPA will notify Respondents of that determination and will either modify this Order or issue a new Order to address any additional removal action.

XXVI. NOTICE OF COMPLETION OF WORK

91. When EPA determines, after EPA's review of the final report, that all Work has been fully performed in accordance with this Order, with the exception of any continuing obligations required by this Order, including reimbursement of Response Costs and Record Retention, EPA will provide written notice to Respondents. If EPA determines that any Work has not been completed in accordance with this Order, EPA will notify Respondents, provide a

list of the deficiencies, and require that Respondents modify the Work Plan, if appropriate, in order to correct such deficiencies within five days after receipt of the EPA notice. The modified Work Plan shall include a schedule for correcting such deficiencies. Within five days after receipt of written approval of the modified Work Plan, Respondents shall implement the modified and approved Work Plan and shall submit a modified Final Report in accordance with the EPA notice. Failure by Respondents to implement the approved modified Work Plan shall be a violation of this Order.

XXVII. SEVERABILITY

92. If a court issues an order that invalidates any provision of this Order or finds that Respondents have sufficient cause not to comply with one or more provisions of this Order, Respondents shall remain bound to comply with all provisions of this Order not invalidated or determined to be subject to a sufficient cause defense by the court's order.

It is so ORDERED.

BY: [signature] DATE: October 30, 2015

John Lyons
Acting Assistant Director, California Sites Cleanup Branch, Superfund Division
Region IX
U.S. Environmental Protection Agency

EFFECTIVE DATE: October 30, 2015

APPENDIX B

Health and Safety Plan

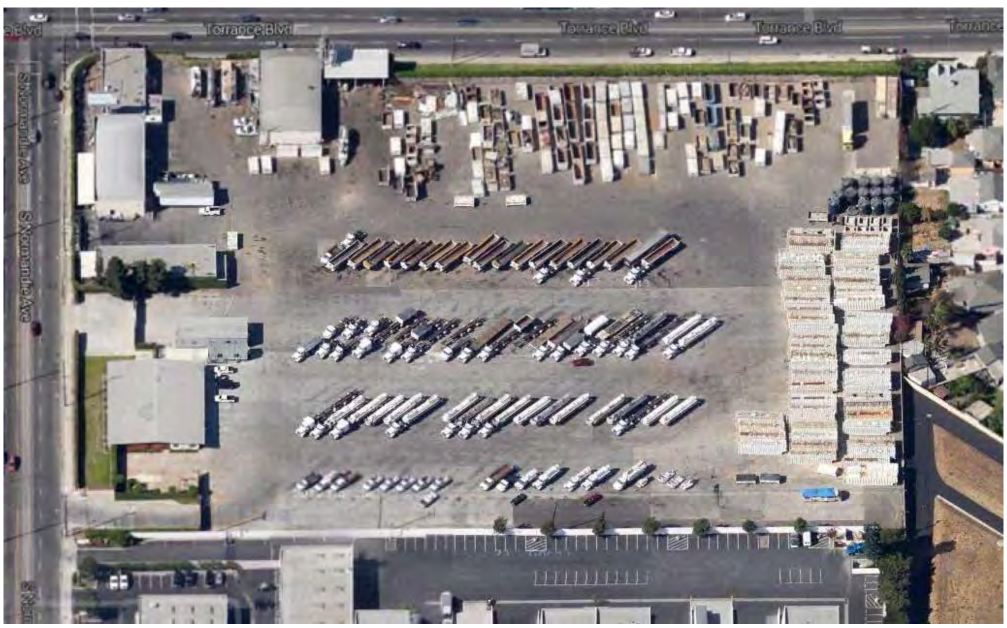
Sharp
Environmental
Technologies, Inc.

839 S. Beacon Street, #1967, San Pedro, California 90733 Tel (310) 505-3675 Fax (310) 548-3935

SITE HEALTH AND SAFETY PLAN

ECOLOGY CONTROL INDUSTRIES

20846 Normandie Avenue
Torrance, California 90502



Prepared for

MR. RON FLURY
ECOLOGY CONTROL INDUSTRIES
20846 Normandie Avenue
Torrance, California 90502

November 20, 2015

SITE HEALTH AND SAFETY PLAN
FIELD ACTIVITIES
ECOLOGY CONTROL INDUSTRIES, TORRANCE, CALIFORNIA 90502

Project Number	ECI Work Plan	Telephone
SET CEO/President	Diana Roman	310-801-0875
Project Manager	Jeff Sharp	310-505-3675
Site Contact	Ron Flury	310-354-9999
Site Health and Safety Supervisor	Jim Porter	562-833-5609
Plan Preparer	Gabi Baader	626-712-0589
Health and Safety Manager	Matt deHaas	661-917-9024
Plan Preparation Date	November 20, 2015	
Plan Review	November 20, 2015	

APPROVALS

Gabi Baader (Professional Geologist, Plan Preparer) **Date**

Matt deHaas (Health and Safety Manager) **Date**

Diana Roman (SET CEO/President) **Date**

This Site Health and Safety Plan is valid only for this specific project as described in Section 2. It is not to be used for other projects or subsequent phases of this project without the written approval of the Health and Safety Manager. The plan was prepared under the direct supervision of a certified industrial hygienist. A copy of this plan is to be maintained at the site at all times.

TABLE OF CONTENTS

1. SUMMARY INFORMATION

1.1 Administration Information

Site Name:	Ecology Control Industries
Site Location:	20846 Normandie Avenue, Torrance, California 90502
Site Contact Name/Phone:	Ron Flury, 310-354-9999
Project Manager:	Jeff Sharp, 310-505-3675
Site Health and Safety Supervisor:	Jim Porter, 562-833-5609

1.2 Emergency Information

Ambulance:	911
Fire:	911
Police:	911
Hospital:	LA County Harbor-UCLA Medical Center, 310-222-2345
SET Principal Geologist:	Jeffrey Sharp, 310-505-3675
Health and Safety Manager:	Matt deHaas, 661-917-9024
Site Contact	Ron Flury, 310-354-9999

1.3 Hospital Directions

To reach the hospital at 1000 West Carson Street, Torrance, California from the site:

1. Start out heading south on Normandie Avenue and proceed for 0.7 miles,
2. Turn left (east) on West Carson Street and proceed for 0.4 miles,
3. Turn right (south) for 141 feet,
4. Turn left (east) for 243 feet,
5. The hospital is on the right (south) after 233 feet.

The route map to LA County Harbor-UCLA Medical Center is provided on the following page.

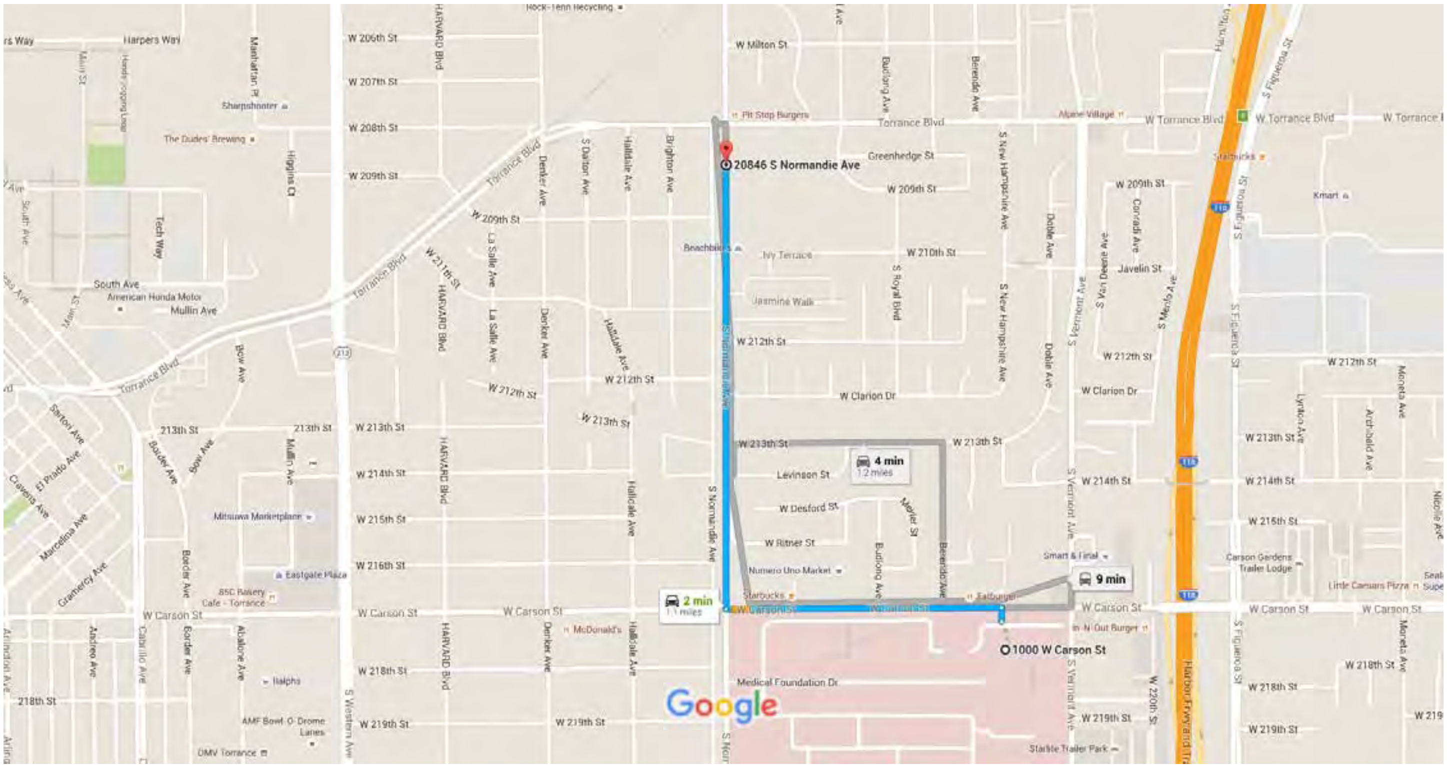
Note: Additional information concerning emergency procedures is provided in Section 11. A copy of the hospital route map must be readily available in each site vehicle that may be used to transport accident victims to the hospital.

Figure 1 – Vicinity Map/Route to Hospital

Google Maps

1000 W Carson St, Torrance, CA to 20846 S Normandie Ave, Torrance, CA 90502

Drive 1.1 miles, 2 min



Map data ©2015 Google 500 ft

via W Carson St and S Normandie Ave — 2 min
2 min without traffic — 1.1 miles

via W 213th St and S Normandie Ave — 4 min
4 min without traffic — 1.2 miles

10:29 AM–10:38 AM — 9 min
1

1.4 Constituents of Potential Concern

- Total petroleum hydrocarbons as carbons chain (TPHcc)
- Volatile organic compounds (VOCs)
- Polychlorinated biphenyls (PCBs)
- Polycyclic aromatic hydrocarbons (PAHs)
- Organochlorine pesticides (OCPs)
- California Code of Regulations, Title 22, metals (17 metals)

Additional information regarding site history, constituents of concern, and scope of work activities is located in Sections 3 and 4.

1.5 Safety Equipment Required

- Hard hat
- Eye protection (safety glasses)
- Ear plugs, disposable
- First aid kit
- Gloves, vinyl
- Fire extinguisher (ABC type)
- Safety boots/shoes
- Portable photo-ionization detector (PID)

1.6 Personal Protective Equipment Required

Task	Level of Protection (PPE)	
	Initial	Upgrade
Task 1 Soil Sampling	Level D	Level C
Task 2 Air Monitoring	Level D	Level C
Task 3 Soil Loading	Level D	Level C
Task 4 Transportation	Level D	Level C

2. INTRODUCTION

This Site Health and Safety Plan (SHSP) prepared by Sharp Environmental Technologies, Inc. (SET) establishes requirements and provides guidelines for worker safety and hazard identification during the management of existing soil stockpiles at the Ecology Control Industries located 20846 Normandie Avenue in Torrance, California 90502, Figure 1. This SHSP is intended to be in compliance with applicable Occupational Safety and Health Administration (OSHA) regulations found in the California Code of Regulations (CCR) Title 8 section 5192.

This SHSP is a site-specific document, which will be onsite, and addresses the safety and health hazards of specific phases of site operations designated and identified in this SHSP. This SHSP also includes the requirements and procedures for employee protection. The information provided presents the minimum health and safety requirements for establishing and maintaining a safe working environment during the site operations designated in this SHSP. In the event of conflicting safety requirements, the procedures or practices that provide the highest degree of workplace safety will be implemented. SET will make the appropriate revisions to this SHSP if work plan specifications change, or if site conditions and/or health and safety hazards encountered during the designated site operations are found to differ substantially from the initial site information relied upon to prepare this SHSP.

This SHSP is prepared for the exclusive use by SET for personnel and site operations under the direction and control of SET. If expressly stated, this SHSP may also cover other specific designated tasks performed by subcontractors or other third parties at the site that otherwise are not under the direction and or control of SET. Under these circumstances, SET assumes no additional site safety responsibility nor direction nor control for the aforementioned subcontractors or third parties except for the specific and limited designated site operations and related tasks expressly covered in this SHSP. Furthermore, when expressly authorized by SET in writing, this SHSP may apply to the site operations performed by subcontractors retained by SET but only if this SHSP appropriately addresses their activity and potential safety and health hazards, however, under those circumstances, it is the responsibility of the subcontractor to determine if this SHSP appropriately addresses their activities and hazards. Otherwise, all subcontractors are responsible for preparing, maintaining, and implementing their individual SHSPs, health and safety programs, and for providing their own site safety supervision. All site visitors (i.e. client, agency personnel) are expected to observe the safety rules and regulations established by their respective organizations in addition to the requirements of this SHSP.

3. SITE BACKGROUND

The site is located at Ecology Control Industries (ECI), 20846 Normandie Avenue in Torrance, California 90502. The work will be performed at the eastern property boundary within the ECI property identified as the historic storm water drainage channel.

The site consists of a 7.34-acre property currently occupied by ECI as a vehicle and equipment dispatch yard and a temporary hazardous and non-hazardous waste storage facility. The site contains one 5,400-square foot building located along the northern property line and is approximately 90 percent covered with either concrete or paved asphalt, with the remaining area consisting of unpaved soils.

Prior to approximately 1969, the historic storm water pathway in the vicinity of the ECI property was an unlined linear topographic depression that acted as a local surface drainage feature. The drainage channel passed under Torrance Boulevard and traversed the eastern portion of the ECI Property before continuing east through what is now the closed Royal Boulevard Landfill (ARMCO Site).

During the late 1960s and early 1970s, the drainage ditch was replaced by the Los Angeles County Flood Control District (LACFCD) with an underground concrete storm water conveyance system. Project No. 685 (also known as the Kenwood Drain), a concrete box culvert, replaced the historic storm water drainage ditch from 204th Street, along Kenwood Avenue, through the ECI property, and eventually emptying into the Torrance Lateral, a large, open, and concrete-lined drainage channel. The

LACFCD maintains an easement for Project 685 within the properties it traverses, including the ECI property.

In 2005, pesticides and polychlorinated biphenyls (PCBs) were detected in soil by ECI as part of due diligence activities prior to sale of the property. The due diligence sampling activities detected several chemicals present in soils at concentrations exceeding residential action levels, including: dichlorodiphenyl-dichloroethane (DDD), dichlordiphenyl-dichloroethylene (DDE), dichlorodiphenyl-trichloroethane (DDT), chlordane, petroleum hydrocarbons, and PCBs. The sum of DDT, DDE, and DDD concentrations (referred to collectively as total DDT) were detected in subsurface soil samples collected from the eastern and southeastern portions of the ECI property in concentrations up to 325 mg/kg. Although contended by Montrose, EPA has attributed the presence of total DDT in these soils to former Montrose chemical manufacturing activities. From 1947 to 1982, Montrose manufactured technical grade DDT at a plant located approximately 0.5 miles north/northwest of the ECI property. EPA believes that DDT-impacted soils at the ECI property may be the result of contaminated storm water runoff from the former Montrose plant. The ECI property is located “downstream” from the former Montrose plant property, by way of the historical storm water drainage pathway.

Based on the data collected during previous investigations, a removal action was implemented in 2015 to address the removal of soils impacted with contaminants of concern at the site. Contaminated soil was removed from the shallow subsurface to depths of approximately 25 feet in impacted areas, and the contaminated soil was segregated and stockpile on-site.

This Health and Safety Plan has been prepared as an Appendix and supplement to the *Soil Stockpile Removal Work Plan* for the proposed soil stockpile management and removal at the site.

4. PLANNED WORK ACTIVITIES

This SHSP covers the designated site operations that will be performed by SET at the eastern area along the property boundary where four soil stockpiles exist.

4.1 Mobilization/Demobilization

Subcontractors will provide loading and transportation equipment including mobilization/demobilization. The sampling equipment and materials will be mobilized by SET.

4.2 Air Monitoring

SET will conduct air monitoring near the sampling areas using a PID if warranted.

4.3 Soil Sampling

Soil samples will be collected from the soil stockpiles according to the sampling and analysis plan or as required by the EPA. Samples will be labeled, submitted to a state-certified mobile laboratory or/and placed on ice and transported to a mobile and/or stationary laboratory for analysis.

4.4 Removal Action

Soil will be monitored and loaded for off-site transportation to a licensed disposal or recycling facility.

Soil samples will be collected according to the work plan from stockpiled soil for profiling and disposal facility selection. Samples will be labeled, placed on ice and transported to a state-certified laboratory. Soil and samples will be analyzed as described in the work plan.

5. SITE HAZARD ANALYSIS

Site operations designated in this SHSP may result in exposure to the following general types of chemical, biological, or physical hazards.

5.1 Site Hazard Overview

A hazard analysis of the work activities that involves potential exposure to chemical contaminants or physical hazards is provided in the following table. The hazard analysis provides a general ranking of high, moderate or low based on anticipated site conditions.

Potential Hazard	Task 1 Soil Sampling	Task 2 Air Monitoring	Task 3 Soil Loading	Task 4 Transportation
Inhalation of vapors	Moderate	Moderate	Moderate	Moderate
Skin and Eye contact	Moderate	Moderate	Moderate	Moderate
Ingestion	Low	Low	Low	Low
Inhalation of Dust	Moderate	Moderate	High	High
Heat Stress	Moderate	Moderate	Moderate	Moderate
Heavy Equipment	Moderate	Low	High	High
Traffic	Moderate	Moderate	High	High
Noise	Moderate	Low	High	High
Trips/Falls	Moderate	Low	High	High
Utilities	Low	Low	Moderate	Moderate
Electrical	Low	Low	Low	Low
Illumination	Low	Low	Low	Low
Flammable Hazards	Low	Low	Low	Low
Biological Hazards	Low	Low	Low	Low
Other	Low	Low	Low	Low

Exposure to elevated levels of hydrocarbon vapors presents potential health risks that need to be properly understood and controlled. These vapors constitute a health hazard when inhaled, and they present a fire or explosion risk when they accumulate in an explosive mixture with oxygen. Where elevated exposures risks are determined to exist, respiratory protection will be the primary control method to protect personnel from inhalation of hydrocarbon vapors.

5.2 Chemical Hazards

Chemical hazards of concern (COCs) associated with the site operations that are covered by this SHSP include VOCs. Exposure to the aforementioned COCs can occur via inhalation of chemical vapors and gases, inhalation of contaminated dust and soil particles and dermal contact with contaminated soil.

In California, Permissible exposure limits (PELs) for COCs are found in CCR Title 8, Section 5155. PELs refer to the maximum allowable airborne concentrations of hazardous substances and represent concentrations at which it is believed that nearly all the workers may be repeatedly exposed, eight hours per day, for a 40-hour workweek, without adverse effect. However, due to the wide variation in individual susceptibility, a small number of workers may experience discomfort to some or all of these chemical substances at concentrations equal to or below the PEL. A still smaller percentage of persons may be affected more seriously from exposures at or below the PEL due to aggravation of a pre-existing condition or development of an occupational illness. The majority of PELs are expressed as a time-weighted average based on an eight-hour workday, five days a week or 40-hour workweek. The PEL is an average exposure concentration spread over a 480-minute exposure period. CAL/OSHA also has established short-term exposure limits (STEL) for certain substances that typically have strong irritant properties. STELs are based on a 15-minute average exposure limit. In addition some substances have ceiling exposure limits that establish exposure limits that cannot be exceeded at any time. In many cases, a specific chemical hazard will have an eight-hour PEL, a 15-minute STEL and a ceiling limit. Certain substances, which can readily enter the body via skin contact, are denoted by CAL/OSHA with "S" notation referring to skin absorption. The same notations and standards are used in this SHSP.

The following table lists the COCs associated with the site operations covered by this SHSP and includes routes of exposure, symptoms, PELs, immediately dangerous to life and health (IDLH) concentrations, and lower explosive limits (LEL).

Chemical Name	Route of Exposure	Symptoms	Target Organs
Total petroleum hydrocarbons (TPH)	Inhalation/ingestion/ skin absorption/skin or eye contact	Dizziness, drowsiness, headache, nausea; irritation of the eyes, nose, throat; dry cracked skin	Skin, eyes, respiratory system, central nervous system
Benzene	Inhalation/skin absorption/ingestion/ skin or eye contact	Giddiness, headache, nausea, staggered gait, fatigue, anorexia, lassitude, dermatitis, bone marrow depression (carcinogen)	Blood, central nervous system, skin, bone marrow, eyes, respiratory system
Toluene	Inhalation/ingestion/ skin absorption/skin or eye contact	Fatigue, weakness; confusion, euphoria, dizziness, headache; dilated pupils, lacrimation; nervousness, muscle fatigue; insomnia; paresthesia; dermatitis	Central nervous system, liver, kidneys, skin
Ethylbenzene	Inhalation/ingestion	Irritation of the eyes, mucous membrane, headache; dermatitis; irritation of the eyes,	Eyes, upper respiratory system, skin, central nervous system

Chemical Name	Route of Exposure	Symptoms	Target Organs
Xylenes	Inhalation/ingestion/ skin absorption/skin or eye contact	Dizziness, excitement drowsiness, incoordination, staggering gait; irritation of the eyes, nose, throat; corneal vacuolization; anorexia, nausea, vomit, abdominal pain; dermatitis	Central nervous system, eyes, GI tract, blood, liver, kidneys, skin
Naphthalene	Inhalation/ingestion/ skin absorption/skin or eye contact	Irritation of eyes, headache, confusion, excitement, malaise (vague feeling of discomfort), nausea, vomiting, abdominal pain, irritation bladder, profuse sweating, jaundice, hematuria (blood in urine), renal shutdown, dermatitis, optical neuritis, corneal damage	Eyes, skin, blood liver, kidneys, central nervous system
Methyl tertiary butyl ether (MTBE)	Inhalation/ingestion/ skin absorption	Irritation of eyes, skin, nose, throat; exposure can cause difficulty concentrating and thinking. Higher levels can cause headache, nausea, dizziness, weakness, lightheadedness. Cancer, reproductive organ hazard	Skin, lungs, liver, kidney, CNS
Di-isopropyl ether (DIPE)	Inhalation, ingestion, skin and/or eye contact	Irritation of eyes, skin, nose; respiratory discomfort; dermatitis; drowsiness, dizziness, unconsciousness, narcosis	Eyes, skin, respiratory system, CNS
Ethyl tertiary butyl ether (ETBE)	Inhalation, ingestion, skin and/or eye contact	Irritation of eyes, skin, nose; respiratory discomfort; dermatitis; drowsiness, dizziness, unconsciousness, narcosis	Eyes, skin, respiratory system, CNS
Tertiary amyl methyl ether (TAME)	Inhalation, ingestion, skin and/or eye contact	Irritation of eyes, skin, nose; respiratory discomfort; dermatitis; drowsiness, dizziness, unconsciousness, narcosis	Eyes, skin, respiratory system, CNS
Tertiary butyl alcohol (TBA)	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; drowsiness, narcosis	Eyes, skin, respiratory system, central nervous system
Ethanol	Inhalation/eye contact	Alcohol intoxication	Eye irritant
Methane	Inhalation, skin adsorption, skin or eye contact	Rapid breathing, diminished mental alertness, impaired muscular coordination, faulty judgment, fatigue. As asphyxiation progresses, nausea, vomiting, prostration, loss of consciousness, convulsions, coma, death	Eyes, skin, CNS, respiratory system

Chemical Name	Route of Exposure	Symptoms	Target Organs
Methyl ethyl ketone (MEK)	Inhalation/Ingestion	Irritation of the eyes, nose; headache; dizziness	CNS, lungs
Tetrachloro-ethene (PCE)	Inhalation, skin absorption, ingestion, skin or eye contact	Irritation of the eyes, nose, throat, nausea, headache, dizziness, liver damage (carcinogen)	Liver, kidneys, eyes, upper respiratory system, CNS
Acetone	Inhalation, ingestion, skin or eye contact	Irritation of the eyes, nose, throat; dizziness, CNS depression; dermatitis	Eyes, skin, respiratory system, CNS
Methylene Chloride	Inhalation, skin absorption, ingestion, skin or eye contact	Irritation of the eyes and skin; lassitude (weakness, exhaustion), drowsiness, dizziness; numbness, tingling of limbs; nausea (potential occupational carcinogen)	Eyes, skin, cardiovascular system, CNS
Di-n-octyl-phthalate	Inhalation, skin absorption, ingestion, skin or eye contact	Irritation of the eyes and skin	Eyes, skin, CNS
Trichloroethene (TCE)	Inhalation, skin absorption, ingestion, skin or eye contact	Irritation of the eyes, nose, throat, nausea, headache, dizziness, liver damage, tremors, irregular heartbeat (carcinogen)	Respiratory system, heart, liver
1,1,1-Trichloroethane (TCA)	Inhalation, skin absorption, ingestion, skin or eye contact	Irritation of the eyes, nose, throat, nausea, headache, dizziness, liver damage, tremors, irregular heartbeat (carcinogen)	Skin, CNS, CVS, eyes
1,1-Dichloroethene (1,1-DCE)	Inhalation, skin absorption, ingestion, skin or eye contact	Irritation of eyes, respiratory system, CNS depression	Respiratory system, eyes, CNS
Lead	Inhalation, ingestion, contact	Weakness; facial pallor, pale eyes, low weight; abdominal pain, colic; irritation of eyes	Eyes, skin, respiratory system, liver, kidney, CNS, reproductive system
PAHs	Inhalation, contact, ingestion	Reasonably anticipated to be a carcinogen; may cause birth defects.	CNS, cardiovascular system
Arsenic	Inhalation, contact, ingestion	Ulceration of nasal septum, respiratory irritation, hyperpigmentation of skin, dermatitis	Liver, kidney, skin, lungs, lymphatic system
Lead	Inhalation, ingestion, contact	Weakness; facial pallor, pale eyes, low weight; abdominal pain, colic; irritation of eyes	Eyes, skin, respiratory system, liver, kidney, CNS, reproductive system
Asbestos	Inhalation, ingestion, contact	Irritation of eyes, breathing difficulty, intestinal fibrosis, asbestosis	Respiratory system, eyes

Chemical Name	Route of Exposure	Symptoms	Target Organs
Carbon monoxide	Inhalation	Lowering of consciousness, death	CNS, cardiovascular system
Gamma-chlordane	Inhalation/skin absorption/ingestion/ congestion	Blurred vision, confusion, ataxia, delirium, cough, abdominal pain, nausea, vomiting, diarrhea, irritation	CNS, eyes, respiratory system, liver, kidneys
Alpha-chlordane	Inhalation/skin absorption/ingestion/ congestion	Blurred vision, confusion, ataxia, delirium, cough, abdominal pain, nausea, vomiting, diarrhea, irritation	CNS, eyes, respiratory system, liver, kidneys
4, 4'-DDD	Inhalation/ingestion/ absorption/congestion	Dizziness, drowsiness, headache, nausea; irritation of eyes, nose, throat; dry cracked skin	Skin, eyes, respiratory system, CNS
4,4'-DDE	Inhalation/ingestion/ absorption/congestion	Dizziness, excitement, drowsiness, incoordination, staggering gait; irritation of eyes, nose, throat; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis	CNS, eyes, liver, kidneys, skin
4,4'-DDT	Inhalation/ingestion/ absorption/congestion	Dizziness, excitement, drowsiness, incoordination, staggering gait; irritation of eyes, nose, throat; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis	CNS, eyes, liver, kidneys, skin
Dieldrin	Inhalation/ingestion/ skin absorption/ congestion	Headache, nausea, dizziness, nausea, vomiting, liver damage, kidney damage	CNS, liver, kidneys, skin
Toxaphene	Inhalation/ingestion/ skin absorption/skin or eye contact	Irritation of eyes, nose; loss of balance, drowsiness, headache, nausea, visual disturbances, nausea, dizziness, liver damage (carcinogen)	CNS, liver, kidneys, skin
1,2,4-Trimethyl-benzene	Inhalation, ingestion, skin and/or eye contact	Irritation eyes, skin, nose, throat; respiratory system; bronchitis; hypochromic anemia; headache, drowsiness, lassitude (weakness, exhaustion), dizziness, nausea, incoordination; vomiting, confusion; chemical pneumonitis (aspiration liquid)	Eyes, skin, respiratory system, central nervous system, blood

5.3 Exposure Limits

Chemical name	TWA/STEL/Ceiling	IDLH/LEL
TPH-gasoline	85 ppm/400 ppm	10,000 ppm
Benzene	1 ppm/5 ppm	500 ppm (carcinogen)
Toluene	50 ppm/150 ppm/300 ppm	500 ppm
Ethylbenzene	100 ppm/125 ppm	800 ppm
Xylenes	100 ppm/150 ppm	900 ppm
Tetrachloroethene (PCE)	25 ppm/100 ppm/300 ppm	150 ppm (carcinogen)
Trichloroethene (TCE)	25 ppm/100 ppm/300 ppm	1,000 ppm (carcinogen)
1,1,1-Trichloroethane (TCA)	350 ppm/450 ppm/800 ppm	700 ppm
1,1-Dichloroethene (1,1-DCE)	1 ppm/NE/NE	NE
PAHs	0.1 mg/m3	1,750 mg/m3 (carbon)
Chlordanes	0.5 ppb	100 ppb
Dieldrin	0.25 ppb	50 ppb
4,4-DDD	0.5 ppb	500 ppb
4,4-DDE	0.5 ppb	500 ppb
4,4-DDT	0.5 ppb	500 ppb
Toxaphene	NA	NA
Naphthalene	10 ppm/15ppm/NE	250 ppm/0.9%
1,2,4-Trimethyl-benzene	25 ppm/NE/NE	NE/0.9%
Tertiary butyl alcohol (TBA)	100 ppm/150 ppm/NE	1,600 ppm
Arsenic	0.01 mg/m3	5 mg/m3
Lead	0.1 mg/m3	100 mg/m3

TWA = Time-weighted average (concentration should not be exceeded during an 8-hour workday during a 40-hour work-week)
STEL = Short-term exposure limit (15 -minute TWA exposure that should not be exceeded at any time during a workday)
IDLH = Immediately dangerous to life or health concentrations
LEL = Lower exposure limit
ppm = Parts per million
NE = None established

5.4 Explosive Limits

Chemical Name	LEL	UEL
TPH	1.1%	5.9%
Benzene	1.2%	7.8%
Toluene	1.1%	7.1%
Ethylbenzene	0.8%	6.7%
Xylenes	0.9%	6.7%
MTBE	1.6%	8.4%

Chemical Name	LEL	UEL
DIPE	1.4%	7.9%
ETBE	NE	NE
TAME	NE	NE
TBA	2.4%	8%
Ethanol	3.3%	19%
Methane	5.0%	15.0%
Propane	2.1%	9.5%
MEK	1.4%	11.4%
PCE	NA	NA
Acetone	2.5%	12.8%
Methylene chloride	13%	23%
Di-n-octyl-phthalate	NE	NE
TCE	8%	10.5%
TCA	7.5%	12.5%
1,1-DCE	6.5%	15.5%
Arsenic	NA	NA
PAHs	NA*	NA*
Gamma-chlordane	NA	NA
Alpha-chlordane	NA	NA
4, 4'-DDD	NA	NA
4, 4'-DDE	NA	NA
4, 4'-DDT	NA	NA
Dieldrin	NA	NA
Toxaphene	NA	NA
Carbon monoxide	17.5%	74.2%
Naphthalene	0.9%	5.9%
1,2,4-Trimethyl-benzene	0.9%	6.4%
TBA	2.4%	8%

LEL = Lower exposure limit
UEL = Upper exposure limit
NE = None established

5.5 Physical Hazards

The following potential health and safety hazards may be encountered during scheduled activities at the sites:

- Noise
- Heavy equipment
- Electrical sources

- Fire/explosion
- Slips, trips, and falls
- Illumination
- Cold stress
- Heat stress
- Underground and overhead utilities
- Fall protection
- Confined space hazards
- Materials and equipment handling
- Traffic
- Safety equipment failure
- Excavations
- Elevated work platforms
- Drilling

5.5.1 Noise

Hearing protection should be worn at the site if noise levels exceed 85 decibel. Hearing protection with a noise reduction rating of at least 25 decibel should be worn (i.e., earplugs or earmuffs). The SHSS will inform site personnel when and if hearing protection is required. High noise levels are usually associated with the operation of drill rigs, compressors, generators, pumps, motors, and portable hand tools including drills and jackhammers. If loud noise is apparent or if normal conversation becomes difficult, hearing protection should be worn. Follow manufacturers instructions on how to insert, wear and fit test hearing protectors.

5.5.2 Heavy Equipment

Equipment, including earth-moving equipment, drill rigs, or other heavy machinery, will be operated in accordance with the manufacturer's operating manual and with all applicable safety regulations and standard operating procedures. The operator is responsible for maintaining his/her equipment in good working condition and for inspecting the equipment daily to verify that it is functioning properly and safely. The operator will ensure that a copy of the equipment-operating manual is kept with the equipment at all times. Prior to start up, the operator will inform the SHSS of any unique equipment hazards or safety concerns associated with the equipment. Unless otherwise specified, SET will not assume any direction or control over heavy equipment used at the site.

Operation of equipment at the site for the activities outlined above poses potential physical hazards. The following precautions should be observed whenever heavy equipment is in use:

- Personal Protective Equipment (PPE), including steel-toed boots, safety glasses, and hard hats, must be worn.
- Personnel must be aware of the location and operation of heavy equipment and take precautions to avoid getting in the way of its operation. Workers must never assume that the

equipment operator sees them; eye contact and hand signals should be used to inform the operator of the location of site personnel working in the vicinity.

- Traffic safety vests are required for personnel working near mobile heavy equipment or near high traffic areas.
- Personnel should not walk directly behind, or to the side of, heavy equipment without the operator's knowledge or visual contact.

In addition, nonessential personnel will be kept out of any work area in which heavy equipment is operating.

5.5.3 Electrical Hazards

Electrocution may result from contact with overhead power lines, downed electrical wires, buried cables, lightning, use of electrical equipment in wet areas, and/or failure of electrical equipment. Location of all overhead and underground utility lines will be determined and mapped before commencing work. In case of a breach of an utility line, electricity supply to the site will be shut off. If adverse weather conditions develop, accompanied by lightning, work will stop promptly. Electrical repair/maintenance work must be done only by qualified personnel.

Electrical equipment to be used during field activities will be suitably grounded and insulated. Ground fault circuit interrupters, or equivalent, will be used with electrical equipment to reduce the potential for electrical shock.

Lockout/tag out procedures will be conducted in accordance with 8 CCR 3314 before activities begin on or near energized or mechanical equipment that may pose a hazard to site personnel. Workers conducting the operation will positively isolate the piece of equipment, lock/tag the energy source, and verify effectiveness of the isolation. Only employees who perform the lockout/tag out procedure may remove their own tags/locks. Workers will be thoroughly trained prior to initiating this procedure.

5.5.4 Explosion and Fire

The presence of flammable gases or vapors may cause a fire or explosion. Potential causes of explosion and fire include:

- Chemical reactions;
- Ignition of explosive or flammable chemicals; and,
- Sudden release of materials under pressure.

Any site activities that may involve the presence of flammable gases or vapors will require continuous air monitoring using a four gas direct reading instrument. All potential ignition sources will be kept away from an explosive or flammable environment, and only non-sparking, explosion proof equipment will be used. In addition, safe practices will be followed when performing any task that might result in the agitation or release of chemicals. Open flame or tobacco smoking will be strictly prohibited at the sites. All flammable liquids will be stored in approved containers and the quantities will be limited to one-day use.

If the four-gas instrument exceeds 10% of the LEL, all site activities will cease, equipment will be shut down and site personnel will be evacuated. In the event of a fire, work will cease, the area will be evacuated, and the local fire response team immediately will be notified. Only trained, experienced fire fighters will be allowed to extinguish substantial fires at the sites. Site personnel will not attempt to fight fires, unless properly trained and equipped to do so. At least one fully charged ABC dry chemical fire extinguisher will be readily available for use during all scheduled activities at the sites.

5.5.5 Slips, Trips, and Falls

These types of hazard result from unleveled or slippery surfaces, high-risk positioning, and the presence of hard-to-see objects (e.g., rope, cords, cables, above-ground piping, hills etc.) in areas where workers walk. Appropriate warning signs will be posted wherever this danger has been identified. Workers will take extra caution while working on steep slopes and in high-risk positions.

5.5.6 Illumination

If work activities occur before sunrise or after sunset, adequate lighting will be provided in each work area to meet the requirements of Title 8 CCR section 5192 (m).

5.5.7 Cold Stress

Workers performing activities during winter and spring months may encounter conditions such as extremely cold temperatures, snow and ice, which can make field activities difficult. Adequate cold weather gear, especially head and footwear, will be required under these conditions. Workers should be aware of signs and symptoms of hypothermia and frostbite, as well as first aid for these conditions. These signs and symptoms are summarized in the table below.

Condition	Signs	Symptoms	Response
Hypothermia	Confusion, slurred speech, slow movement.	Sleepiness, confusion, warm feeling.	Remove subject to warm area, such as truck cab; give warm fluids; warm body core as rapidly as possible; remove outer clothing and wrap torso in blankets with hot water bottle or other heat source. Get medical attention immediately.
Frostbite	Reddish area on skin, frozen skin.	Numbness or lack of feeling on exposed skin.	Place affected extremity in warm, not hot, water or wrap in warm towels. Get medical attention.

5.5.8 Heat Stress

Heat stress and associated complications can be the most prevalent health hazard at many sites, especially when PPE is used. Workers in PPE may experience varying degrees of heat stress if precautions are not taken. It is important to remember that individuals react to heat in different ways. Workers should be aware of signs and symptoms of heat-related illnesses, as well as first aid for these conditions. These signs and symptoms are summarized in the table.

Condition	Signs	Symptoms	Response
Heat Rash or Prickly Heat	Red rash on skin	Intense itching and inflammation	Increase fluid intake and observe affected worker.
Heat Cramps	Heavy sweating, lack of muscle coordination	Muscle spasms, and pain in hands, feet, or abdomen	Increase fluid uptake and rest periods. Closely observe affected worker for more serious symptoms.
Heat Exhaustion	Heavy sweating; pale, cool, moist skin; lack of coordination, fainting	Weakness, headache, dizziness, nausea	Remove worker to a cool, shady area. Administer fluids and allow worker to rest in cool area until fully recovered. Increase rest periods and closely observe worker for additional signs of heat exhaustion. If symptoms of heat exhaustion recur, treat as above and release worker from the day's activities after he/she has fully recovered.
Heat Stroke	Red, hot, dry skin; disorientation; unconsciousness	Sweating stops; nausea, dizziness and confusion; strong, rapid pulse	Immediately contact emergency medical services by dialing 911. Only certified first aid personnel should administer care. Remove the victim to a cool, shady location and observe for signs of shock. Attempt to comfort and cool the victim.

The following procedures will be used to reduce the potential that workers will experience symptoms of heat stress:

- Use administrative controls. Tasks will be scheduled to avoid heavy physical activity during the hottest period of the day and work will be performed in the shade whenever possible. Additional workers will be used during hot periods and the pace of work reduced whenever possible.
- Acclimatize the body. Workers will be allowed a period of adjustment to make heat exposure endurable.
- Drink liquids to replace body water lost during sweating. Workers will be encouraged to drink at least 1 cup of fluid every 20 minutes. To promote such consumption, fluids (i.e., water) will be located at or near where the work is being performed.
- Implement a work/rest regimen. This regimen will be increased (i.e., the frequency and duration of rest breaks) as needed to reduce overall heat exposure.
- Wear appropriate clothing. Worker clothing should be light in weight and in color, loose fitting where possible, and made of cotton or a synthetic fabric that allows perspiration to be wicked away from the skin to evaporate. Apply sunscreen to exposed if needed.

5.5.9 Underground and Overhead Utilities

The location of underground pipes, electrical conductors, and water and sewer lines must be determined before intrusive soil work is performed. Lines must be de-energized, blocked out, or blinded where feasible. Work is not permitted within 15 feet of any high voltage overhead power line. Equipment with articulated upright booms or masts will not be permitted to pass within 20 feet of an overhead utility line while the boom is in the upright position.

5.5.10 Materials and Equipment Handling

The movement and handling of equipment and materials on the site can pose a risk to workers in the form of muscle strains and minor injuries. These injuries can be avoided by using safe handling practices, proper lifting techniques, and proper personal safety equipment such as steel-toed boots and sturdy work gloves. Where practical, mechanical devices will be used to assist in the movement of equipment and materials, workers will not attempt to move heavy objects by themselves without using appropriate mechanical aids such as drum dollies or hydraulic lift gates.

5.5.11 Housekeeping and Sanitation

In order to promote safe and efficient work conditions, all work areas will be kept clean and free of debris. All hand tools will be kept out of the immediate work area until they are needed for use. Potable water will be made available for first aid, drinking, and personal hygiene purposes.

5.5.12 Traffic Safety

Vehicle traffic, unrelated to site activities may be present, particularly when working on streets and highways. When working in an area open to vehicular traffic, the work area will be clearly delineated by use of cones, signs and other appropriate warning devices to restrict vehicular access. Personnel exposed to vehicular traffic will use high-visibility clothing (e.g., bright orange vest) in accordance with the requirements of 8 CCR 1598(c). If necessary, the SHSS will require the use of a flagger or other appropriate traffic control measures.

5.5.13 Safety Equipment Failure

If monitoring instruments or any safety equipment fails, work will be suspended until repairs or replacements for that equipment can be found. In case of working equipment failure, field safety personnel will ensure that hazardous conditions have been abated before authorizing further work.

5.5.14 Drilling

Operation of drilling and sampling equipment during site activities presents potential physical hazards to personnel. During all site activities, PPE such as steel-toed shoes, safety glasses or goggles, and hardhats should be worn whenever such equipment is present. Personnel should be aware of the location and operation of drilling and sampling equipment at all times and take precautions to avoid obstructing operation of the equipment.

During setup of the drilling rig, overhead power lines pose a danger of shock or electrocution if the power line is contacted or severed during site operations. Before work is conducted in areas where overhead lines could be encountered, the appropriate utility company will be notified, and information will be obtained regarding the minimum separation distance required for work in this area. A minimum separation distance of 10 feet will be maintained at all times. Use of a spotter is required, at a minimum, to maintain proper clearance.

Water exposure to construction activities is a potential hazard. Heavy machinery, moving traffic and foot traffic must be watched out for. Workers on-site must wear hardhats and steel-toed boots. Barricades and caution tape will surround the construction. Adequate areas will be marked for traffic.

5.5.15 Excavation and Loading

Operation of excavation and loading equipment during site activities presents potential physical hazards to personnel. During all site activities, personal protective equipment (PPE) such as steel-toed shoes, safety glasses or goggles, and hard hats should be worn whenever such equipment is present. Personnel should be aware of the location and operation of excavation and loading equipment at all times and take precautions to avoid obstructing operation of the equipment.

During setup of the excavation and loading equipment, overhead power lines pose a danger of shock or electrocution if the power line is contacted or severed during site operations. Before work is conducted in areas where overhead lines could be encountered, the appropriate utility company will be notified, and information will be obtained regarding the minimum separation distance required for work in this area.

Water exposure to construction activities is a potential hazard. Heavy machinery, moving traffic and foot traffic need to be watched out for. Workers on-site need to wear hard hats and steel-toed boots. The construction will be surrounded by barricades and caution tape. Adequate areas will be marked for traffic.

Excavation and trenches are commonly found on hazardous waste site investigations or cleanups. Trenches are narrow excavations made below the surface of ground, generally deeper than they are wide and less than 15 feet in width. They are used in the risk assessment/feasibility study phase of a project and in the construction or cleanup phase. Activities in the trenches may include sampling buried containers; sampling subsurface soil, sludges, and other materials; and establishing control areas around extremely hot areas to prevent further contamination.

Employees working in trenches may be exposed to many hazards other than the chemicals that are to be removed in the cleanup operation. Workers may come in contact with underground utility lines or pipes, which can cause a potentially fatal electrical or fire hazard. Typical hazards include cave-in of trench walls, oxygen-deficient atmospheres, accumulations of heavier-than-air gases or vapors, and objects falling on workers from a higher elevation. Slips and falls are also prevalent inside the trench or from ground level into the trench. Heavy equipment in operation around the trench can cause serious accidents if all employees are not observant of heavy equipment safety rules.

Injuries associated with trenching on hazardous waste sites can be minimized by following OSHA Construction Standards contained in Title 29 CFR 1926 Subpart P and Title 8 CCR, Sections 3203 and 1509 and Article 3, Sections 6507 and 6760.

Prior to excavation, the following precautions will be observed:

- Check the area to be excavated for any underground pipelines, transmission lines, etc. Consult with utility companies as needed.
- Determine soil composition (e.g., through soil sampling, soil maps, etc.) and other relevant site conditions, with special emphasis on conditions conducive to cave-ins.

During excavation and work in trenches, the following precautions will be observed:

- Follow standard construction safety procedures:
  - Heavy equipment safety.
  - Good housekeeping (e.g., keep tools and equipment clear of tops of trench walls).
  - Wear hard hats and other required protective equipment.
- Utilize ditches, dikes, pumps, or other means to keep surface water out of trenches.
- Water should not be allowed to accumulate in any excavation.
- Monitor the atmosphere in and around trenches on a regular basis to check for explosive, toxic, or otherwise dangerous gases and vapors:
  - Bear in mind that trenches represent a confined space hazard, as well as a low-lying area hazard.
  - Be especially cautious if heavier-than-air gases are encountered (i.e., gases having a vapor density in excess of one).
  - Utilize appropriate engineering controls (e.g., ventilation), work practices, and PPE as needed.
- Trenches in excess of 3 feet deep must have steps or ladders located so that all workers within the trench are within 25 feet of a place of exit [OSHA, Title 29 CFR 1926, Sections 651 and 652].
- Excavated material shall be placed at least 2 feet from the edges of excavations, unless effective barriers are in place to prevent the excavated material from falling into the excavation.

Precautions to prevent cave-in (as described below) should be strictly followed.

The following conditions increase the likelihood of cave-in:

- Soil materials composed of unconsolidated, uncompacted, and/or rounded particles. Special care must be used when trenching in areas which have previously been excavated and backfilled.
- Soils which have a high water content.
- Loading of trench walls by adjacent equipment, supplies, structures, backfill piles, etc.
- Vibration due to equipment operating near excavations.
- Trench walls which are steeper than the angle of repose of the material composing the walls.
- Deep trenches (i.e., high trench walls).

The following precautions should be used to prevent cave-ins in all trenches in excess of 5 feet deep. These precautions should also be used in trenches less than 5 feet deep whenever those site conditions just listed indicate the likelihood of a cave-in:

- *Sloping*. Trench walls should be sloped to the correct angle of repose.

- *Shoring*. Vertical trench walls (unless composed of solid rock) must be shored and braced, or restrained with movable trench boxes, to prevent cave-ins.
- Shoring systems must be designed by qualified person and meet accepted engineering requirements.
- Shoring must be installed from the top down and removed from the bottom up.

- Additional precautions (e.g., added shoring bracing or a flatter slope angle) should be utilized whenever site conditions indicate that they are needed to prevent cave-ins.
- Excavations should be inspected by a competent person daily, and after any event (e.g., rainfall) which may increase the likelihood of cave-in. If inspection indicates the potential for a cave-in, all work should cease until appropriate precautionary measures are taken.

Trenches which (1) will not be entered by workers; and (2) will be immediately backfilled (e.g., for permeable treatment walls) are exempted from the requirements listed here.

When the procedures outlined above are followed, trenching can be a useful control on a hazardous waste site. It should be emphasized that construction hazards must be avoided as much as chemical exposure hazards.

5.5.16 Confined Space Entry

This SHSP does not cover confined space entry. A separate site-specific confined space hazard plan must be prepared and implemented for any confined space work. The following is provided for informational purposes only.

Confined spaces may be described as having, but not being limited to, the following characteristics:

- Is large enough to permit a worker to enter and perform work;
- Has limited or restricted means of entry and exit; and,
- Is not equipped, designed, or intended for continuous human occupancy.

Confined spaces become permit-required confined spaces if any one of the following exists:

- Contains or has the potential to contain a hazardous atmosphere;
- Contains or has the potential to contain a material that could engulf or entrap a worker;
- Is configured such that a worker may become trapped, disoriented, or asphyxiated by wall configurations or smaller cross sections; and,
- Contains other safety or health hazards, such as energized equipment or moving parts.

Before workers may enter a permit-required confined space, an entry permit must be completed and approved by the project manager. All permit requirements for entry must be met (see Title 8 CCR sections 5157, 5158 and 5159 for details and guidance).

5.5.17 Elevated Work Platforms

When working at heights that expose workers to falls of greater than 6 feet, especially on sloping roofs and elevated platforms, the requirements of 8 CCR 1670 will be observed. Approved fall protection devices will be required. Elevated work platforms will be constructed, used, and maintained in accordance with Articles 21 and 22 of the Cal/OSHA Construction Safety Orders. Scaffolds and hoisting lines will be inspected daily by a competent person. All defective equipment may not be used for any purpose and will be replaced immediately.

5.6 Biological Hazards

The biological hazards that may be encountered at the site include possible exposure to:

Fur-bearing animals: Such animals (rats, skunks, raccoons) may potentially carry the rabies virus or ticks that may transmit Lyme disease to humans. Personnel should avoid contact and should not attempt to feed or touch such animals.

Poisonous reptiles: Snakes (e.g., rattlesnakes) are the most common poisonous reptiles. Personnel should avoid contact and areas that may harbor snake populations including high grass, shrubs, and crevices. If snakebite occurs, seek immediate medical attention.

Poisonous insects: Common examples include bees and wasps. Personnel should avoid contact with insects and their hives. Most bites and stings can be handled by first aid treatments. However, stings from insects such as bees and wasps can be fatal if a severe allergic reaction such as anaphylactic shock occurs. If the victim has medication to reverse the effects of the sting, it should be taken immediately. If the victim has a history of allergic reaction, they should be taken to the nearest medical facility. If the victim experiences a severe reaction, a constricting band should be placed between the sting and the heart. The bitten area should be kept below the heart if possible.

Spiders: The black widow and brown recluse spiders are the most venomous. Personnel should avoid contact with spiders and areas where they may hide. A bite by a black widow or brown recluse spider will require immediate medical attention.

Poisonous plants: Common examples include poison ivy and poison oak. Personnel should avoid contact. Long-sleeved shirts and pants will allow some protection against inadvertent contact. If contact occurs with a poisonous plant, all contaminated clothing should be removed and the exposed areas washed thoroughly with soap and water, followed by rubbing alcohol. Calamine lotion can be applied if the rash is mild. Medical advice should be sought if a severe reaction occurs or there is a known history of previous sensitivity.

If any biological hazards are identified at the site, workers in the area should immediately notify the Site Health and Safety Supervisor (SHSS) and other site personnel. Workers who know they are sensitive to any specific biological hazard should not perform any task that would increase their risk of contact or an allergic reaction. Additionally, the SHSS should be informed of any heightened worker sensitivity to biological hazards.

6. AIR MONITORING PROTOCOLS

6.1 Monitoring During Site Operations

Air monitoring at the site will be conducted by the SHSS or other designated person according to the requirements of this SHSP and during designated site operations. Air monitoring will be performed where there may be a question of employee exposure to hazardous concentrations of hazardous substances. In general, air monitoring will be performed inside the work zone for employees likely to have the highest exposures to hazardous substances and health hazards likely to be present above PELs when soil and other materials/containers contaminated with the COCs are moved or disturbed. The aforementioned air monitoring will cover SET related site operations and personnel (i.e., site operations and personnel under the direction and control of SET). If expressly required by this SHSP, the SHSS may also perform air monitoring for other specific designated tasks performed by subcontractors or other third parties at the site that otherwise are not under the direction and or control of SET. Under these circumstances, SET assumes no additional site safety responsibility nor direction nor control for the aforementioned subcontractors or third parties except for the specific and limited assignment of performing air monitoring during the specific site operations expressly covered in this SHSP.

The air monitoring conducted by the SHSS or designee will be used to identify and quantify airborne levels of hazardous substances in order to determine the appropriate level of employee protection needed onsite and if possible to delineate work zones. Site-specific action level criteria must be established for all the instruments that may be used in making field health and safety determinations. Other data, such as the visible presence of contamination and/or odors, employee complaints, may also be used in making field health and safety decisions. As a result, the SHSS may establish exclusion zones and/or require a person to wear a respirator even though atmospheric air contaminant concentrations are below established SHSP action levels.

For sites containing petroleum hydrocarbons such as gasoline and related compounds, and/or certain chlorinated hydrocarbons such as tetrachloroethylene and/or trichloroethylene, monitoring can be accomplished using a PID with a 10.6 electron-volt lamp or equivalent calibrated to isobutylene. Monitoring for the aforementioned gases and vapors should be done at the source of emission as well as in the breathing zone of site personnel believed to represent the highest risk of exposure. The PID will be checked with a calibration gas standard (hexane or isobutylene) prior to each day's activities and at any other time when the instrument response is questionable. The instrument check procedure will be recorded in a logbook and initialed by the person performing the procedure. Other methods of air sampling using colorimetric detector tubes, and/or sampling pumps with charcoal tubes may also be used at the direction of the SHSS or if required by this SHSP. If benzene levels could exceed 1 part per million (ppm) for extended periods of time, colorimetric detector tubes specific for benzene will be required. For certain chlorinated compounds (i.e. methyl chloroform), an 11.7 electron-volt lamp should be used in the PID. Consult the NIOSH pocket guide to chemical hazards for information on ionization potentials before selecting the appropriate electron-volt lamp.

For sites containing flammable or explosive gases and/or vapors (i.e. methane gas), and/or hydrogen sulfide and/or carbon monoxide, and/or oxygen deficiency atmospheres, monitoring will be accomplished using a four-gas direct reading instrument calibrated for methane, hydrogen sulfide, carbon monoxide and oxygen. Monitoring for the aforementioned gases and atmospheres should be done at the source as well as in the breathing zone of site personnel believed to represent the highest risk of exposure. The four-gas meter will be checked with a calibration gas standard prior to each day's activities and at any other time when the instrument response is questionable. The aforementioned instrument check procedure will be recorded in a logbook and initialed by the person performing the procedure.

For sites containing elevated concentrations of airborne dust that could exceed the applicable PEL, a real-time aerosol monitor will be used. Monitoring for the aforementioned dusts and atmospheres should be done in the breathing zone of site personnel believed to represent the highest risk of exposure. The instrument will be checked prior to each day's activities according to the manufacturers recommendations and procedures and at any other time when the instrument response is questionable. The aforementioned instrument check procedure will be recorded in a logbook and initialed by the person performing the procedure.

All monitoring instruments will be operated and maintained pursuant to the manufacturers written procedures. Instruments that exhibit an inappropriate field response or provide questionable results will not be used and sent out for servicing.

6.2 Air Monitoring Specifications

Instrument	Tasks	Action Levels [a]	PPE	Frequency [b]	Calibration
PID: OVM with 10.6eV lamp or equivalent	Sampling	<5 ppm >5 ppm >25 ppm	Level D Level C Stop work, contact HSM	Initially and periodically during task	Daily
CGI: MSA model 260 or 261 or equivalent	Drilling	0-10% 10-25% LEL >25% LEL	No explosion hazard Potential explosion hazard Explosion hazard; evacuate or vent	Continuous during advancement of boring or trench	Daily
Detector Tube: Draeger benzene specific 0.5/c (0.5 to 10 ppm range) with pre-tube, or equivalent	Sampling	<0.5 ppm 0.5-1 ppm >1 ppm	Level D Level C Level B	Initially and periodically when PID/FIB >1 ppm	Not applicable
Nose-Level Monitor [d]	Drilling	<85 dB(A) 85-120 dB(A) 120 dB(A)	No action required Hearing protection required Stop; re-evaluate	Initially and periodically during task	Daily
Dust Monitor: Miniram model PDM-3 or equivalent	Excavation, earthmoving	<0.05 mg/m3 >0.05 mg/m3	Level D Level C	Continuous during earthmoving tasks	Daily

a Action levels apply to sustained breathing-zone measurements above background.
b The exact frequency of monitoring depends on field conditions and is to be determined by SET; generally, every 5 to 15 minutes if acceptable; more frequently may be appropriate. Monitoring results should be recorded. Documentation should include instrument and calibration information, time, measurement results, personnel monitored, and place/location where measurement is taken (e.g., "breathing zone", "at surface", etc.).
c If the measured percent of O2 is less than 10, an accurate LEL reading will not be obtained. Percent LEL and percent O2 action levels apply only to ambient working atmospheres, and not to confined-space entry. More stringent percent LEL and O2 action levels are required for confined-space entry.
d Noise monitoring and audiometric testing also required.

6.3 Exposure Monitoring Plan

Before any field activities commence, wind direction indicator may be used to ensure the direction that personnel will move when instructed to do so or in an emergency. This wind measurement will be followed by the sampling of the general background levels of gasoline, VOCs, dust etc.

For areas where chemical hazards are suspected, the first person entering the work zone will carry the appropriate instrument and monitor concentration levels in the work area before anyone else is allowed into the work zone. Thereafter, periodic and ongoing air monitoring will be conducted during the following site operations in the work zone and for personnel likely to have the highest exposures to the COCs: drilling and sampling.

6.3.1 Petroleum Vapors Associated with Gasoline

The table below summarizes the various hydrocarbon vapor criteria and appropriate responses to potential vapor hazards. There are certain components, such as benzene vapors, that present significant hazards and must be properly controlled. Criteria for the use of respiratory protection are based on preventing potential exposures to benzene.

Hydrocarbon Vapor Criteria and Response	
Total Hydrocarbon Concentrations above Background Levels (parts per million by volume [ppmv] as measured by PID)	Response
<30 ppmv total hydrocarbon concentration (THC), verify that benzene concentration is below 1 ppm	Limited hazard, no special action.
30–100 ppmv THC for more than two minutes in general work area	Stop work, move upwind, monitor perimeter or don level C (half-face organic vapor respirator with P-100 filter) and continue work or wait until levels decrease.
100–900 ppmv THC in general work area	Wear full-face organic vapor respirators with P-100 filter in work area.
>900 ppmv THC in general work area	Stop work; procedures must be implemented to subdue excessive vapor levels.

7. PROJECT SAFETY PERSONNEL

7.1 Project Manager

The PM is an SET employee who has the responsibility and authority to direct all site operations covered under this SHSP. The PM has the authority to discipline personnel under his/her direction/control and the authority to shut down or stop any site operation under his/her direction/control. In general, the PM is responsible for the following:

- To ensure that a comprehensive work plan has been prepared which addresses the tasks and objectives of the site operations and the logistics and resources required to reach those tasks and objectives;
- To document all work progress;

- To execute the site work plan and SHSP;
- To ensure that a SHSP has been prepared for all appropriate site operations;
- To ensure that the SHSS has been designated and is onsite during all site operations covered by this SHSP;
- To take appropriate action in consultation with the SHSS, upon becoming aware of any deficiency in the implementation of SHSP;
- To become the incident commander during any site emergency until relieved by the appropriate chain in command.

In the event that the PM becomes aware of a deficiency in the implementation of the SHSP, he/she will take appropriate action by consulting with the SHSS.

7.2 Site Health and Safety Supervisor

The SHSS is the individual located at the site, which is responsible to SET and has the authority and knowledge necessary to implement this SHSP and verify compliance with applicable safety and health requirements. In general, the SHSS is responsible for personnel at the site who are under the direction and control of SET. In addition, the SHSS is responsible for the following:

- To observe personnel under the direction and control of SET as well as authorized visitors for indications of impaired health due to contaminant exposure, heat stress, or other hazards;
- To evaluate whether site conditions present hazards not previously predicted or expected;
- To inspect Personal Protective Equipment and verify its use;
- To assist the PM with onsite implementation of this SHSP, including performing air monitoring, maintaining safety equipment supplies and setting up site control and decontamination stations;
- To make daily assessments of health and safety practices at the site and administer the health and safety program outlined in this SHSP.
- To conduct the required tailgate safety meetings for all designated personnel permitted to enter the contaminated area (*i.e.*, the exclusion zone) regarding potential hazards, personal hygiene principles, PPE and emergency response procedures; and;
- To investigate all accidents, health and safety complaints, and violations/infractions of safety rules and/or the requirements of this SHSP and report findings to PM;
- To inform the PM of all safety and health hazards at the site that pose a serious and/or imminent threat; and
- To coordinate emergency response procedures and site evacuations.

The SHSS will have authority to suspend work or modify work practices under the direction and control of SET for safety reasons and to dismiss individuals under the direction and control of SET whose conduct on site endangers the health and safety of others. The SHSS will report directly to the PM.

8. PERSONAL PROTECTIVE EQUIPMENT

The purpose of PPE is to isolate or protect personnel from the chemical and physical hazards that may be encountered at during site activities. The amount and type of PPE required will be based on the nature of the hazard encountered or anticipated.

Personnel under the direction and control of SET will be provided with appropriate personal safety equipment and protective clothing as determined by the SHSS. In general, depending on the level of protection required by the SHSS for site operations, the following required PPE will be worn by all site personnel under the control and direction of the SHSS.

8.1 Level D Protection

- Work shirt and long pants (short pants may be worn with the approval of the PM);
- ANSI-approved steel-toed boots or safety shoes;
- ANSI-approved safety glasses; and,
- ANSI-approved hardhat.

Modified level D may be required by the SHSS and can consist of some and/or all of the following equipment:

- Outer nitrile gloves and inner nitrile surgical gloves when direct contact with chemically affected soils or groundwater is anticipated *(e.g.*, nitrile surgical gloves may be used for collecting or classifying samples as long as they are removed and disposed of immediately after each sampling event);
- Chemical-resistant clothing (*e.g.*, Tyvek or polycoated Tyvek coveralls) when contact with chemically affected soils or groundwater is anticipated. Paper coveralls are permissible when working in a dry dust environment;
- Safety shoes/boots with protective overboots or knee-high PVC polyblend boots when direct contact with chemically affected soils is anticipated;
- Hearing protection; and/or,
- Sturdy work gloves.

8.2 Level C Protection

If air monitoring or other site conditions indicates that the site-specific action levels defined above are exceeded, all workers under the direction and control of SET who are impacted by the elevated air monitoring readings will upgrade their PPE to level C. In addition to the protective equipment specified for level D, level C includes the use of the following equipment:

- NIOSH approved half-face air-purifying respirator (APR) or full face APR equipped with a P100 filter in combination with organic vapor cartridge; the use of any respirators must also be in compliance with the requirements of a written respiratory protection plan pursuant to Title 8 CCR section 5144.

- Chemical-resistant clothing (*e.g.*, Tyvek, polycoated Tyvek, or Saranex coveralls) when contact with chemically affected soils or groundwater is anticipated. Paper coveralls are permissible when working in a dry dust environment.
- Outer nitrile gloves and inner nitrile surgical gloves when direct contact with chemically affected soils or groundwater is anticipated (*e.g.*, nitrile surgical gloves may be used for collecting or classifying samples as long as they are removed and disposed of immediately after each sampling event).
- Safety shoes/boots with protective overboots or knee-high PVC polyblend boots when direct contact with chemically affected soils is anticipated.

8.3 Respiratory Protection

The standard respirator assigned to SET employees for level C work involving gasoline and/or chlorinated solvents consists of a half-face air-purifying respirator. The standard issue cartridge consists of the organic vapor cartridge in combination with a P100 filter.

All personnel under the direction and control of SET who have been assigned a respirator will comply with the written requirements of SET's written respiratory protection program. It is the responsibility of the SHSS to ensure compliance with SET's respiratory protection program. This written program which meets the minimum requirements of Title 8 CCR section 5144 includes but is not limited to the following:

- Individuals required to wear respiratory protection are responsible for inspecting and maintaining their own respirator.
- Procedures for cleaning, inspecting, maintenance, and storage of respirators.
- Individuals required to wear respiratory protection must have medical clearance from a physician or other licensed health care professional.
- Individuals required and approved to wear respiratory protection must be fit-tested at least annually.
- Individuals required to wear respiratory protection must be trained and must conduct a positive and negative pressure check each time they don the respirator.

9. INJURY ILLNESS PREVENTION PROGRAM

SET maintains a written Injury and Illness Prevention Program (IIPP) in addition to this site-specific SHSP. The IIPP addresses procedures for identifying, preventing and correcting workplace hazards. Although the IIPP is not site-specific, appropriate information that is applicable to this SHSP should be referred and used as supplemental information. Some of the information found in the IIPP that may apply to this SHSP includes but is not limited to the following:

- General safe work practices;
- Safety inspections;
- Tailgate safety meetings; and
- Methods for communicating safety concerns and complaints.

9.1 Medical Clearance and Monitoring

Access inside the specified work area will be limited to authorized personnel. Only personnel under the direction and control of SET and other subcontractors and individuals designated and authorized by the client, will be admitted to the work site. Only those workers possessing evidence of physician's authorization to conduct hazardous waste activities will be permitted in the work area designated as the exclusion zone. All project personnel who may be required to wear respirators must provide evidence that they have been cleared by a physician to wear respirators. Other medical surveillance procedures that may be required pursuant to Title 8 CCR section 5192 (f) will implemented and followed.

9.2 Safety Training and Communication

Individuals under the direction and control of SET will not participate in field activities until they have been trained to the level required by their job function and responsibility. The specific types of training required include the following:

- 24 or 40-hour initial OSHA Hazwoper training and annual 8-hr refresher training;
- Site specific hazard training;
- Proof of these required trainings must be kept onsite for each worker participating in field and supervisory activities; and
- Other health and safety trainings may also be conducted on pertinent topics depending on the job task such as fire safety and use of fire extinguishers, lockout/tagout and electrical safety, heat/cold stress, hand/power tools, back safety, slips, trips and falls, traffic safety, driving safety, etc. These training subjects may be included in the daily tailgate safety training.

9.3 Project Orientation

A copy of this SHSP must be made available to each individual under the direction and control of SET and all such personnel who will work on the site are required to read and become familiar with the pertinent and applicable sections this SHSP. Prior to commencing work, individuals must read, understand, and accept the requirements set forth in the SHSP.

To ensure personnel are informed of the potential hazards associated with the project, all personnel under the direction and control of SET as well as subcontractors retained by SET must attend a project initiation meeting prior to commencing fieldwork. The meeting will be scheduled and conducted by the PM, or designated project safety personnel. The project initiation meeting will include information on the site emergency response procedures, and any potential fire, explosion, health, safety or other hazards that have been identified by SET. An attendance sheet describing the contents of the project orientation will be signed and dated by each participant.

9.4 Daily Tailgate Meeting

All personnel under the direction and control of SET will attend a daily tailgate safety meeting prior to commencing a new day of work. The tailgate training will be provided by SET PM or designee. Topics for discussion may include, but not be limited to:

- Discussion of current work activities and associated safety and health hazards;
- Available air monitoring or site characterization data which relates to worker exposure;
- The type and frequency of environmental and personal monitoring (if any) to be performed;
- Task-specific levels of protection and anticipated potential for upgrading;
- Review of emergency procedures; and,
- Subcontractors retained by SET who are not otherwise under the direction and control of SET are required to hold their own tailgate safety meetings, but they are encouraged to also attend and participate in the aforementioned SET tailgate safety meetings.

9.5 Safety Inspections

The SHSS will conduct a safety inspection of the work site before each day's activities to verify compliance with the requirements of the SHSP. All issues of noncompliance must be addressed and immediately corrected, if possible.

9.6 Posting Requirements

The following information will be posted if applicable or will be readily available onsite:

- OSHA poster;
- Proposition 65 Notification;
- Emergency phone numbers; and
- Directions to the nearest hospital.

9.7 Required Site Safety Equipment

Safety equipment items required onsite include the following:

- A multi-class fire extinguisher. If the travel distance to the extinguisher from any point in the site where work is in progress is greater than 50 feet (15.3 m), then additional fire extinguishers will be furnished and strategically located so that the travel distance does not exceed 50 feet. Subcontractor employees will be provided appropriate training regarding the use of fire extinguishers and the hazards involved with incipient stage fire fighting.
- A portable emergency eyewash station if eye hazards are present;
- First-aid kit;
- Bottle of wash water;
- Construction tape, barriers, portable fencing etc. to delineate work zone;
- Spill containment equipment;
- Decontamination equipment; and,
- A vehicle will be kept onsite when personnel are working for the transport of slightly injured personnel to the hospital. Severely injured personnel must only be transported by paramedics.

9.8 Hazard Communication Program

All SET employees who may be exposed to hazardous chemicals in the work place must be provided training and education regarding these hazards. The hazardous communication program provides information about hazardous substances and their control in the workplace. A list identifying the current hazardous chemicals present in the workplace will be kept onsite along with the corresponding material safety data sheet for each chemical.

10. SITE CONTROL AND DECONTAMINATION PROCEDURES

In order to control activities and movements of personnel and equipment at the site, a site control program will be set up and implemented by SHSS. The basic components of a site control program include the establishment of work zones and site security. Decontamination procedures will be implemented to protect personnel and the surrounding community from the hazardous substances encountered during site activities.

10.1 Site Work Zones

The following established work zones will be established:

- Exclusion Zone; this is the area where the contaminated soil, groundwater, or other materials are disturbed, moved and/or handled;
- Contamination Reduction Zone; and
- Support Zone.

The aforementioned work zones will be established based on the extent of anticipated contamination, projected work activities, and the presence or absence of non-project personnel. The physical dimensions and applicability of work zones will be determined by the SHSS for each site operation based geography, available space, nature of job activity and hazards present. Where possible, decontamination and support zone will be set up upwind of exclusion zone. Within these zones, prescribed operations will occur using appropriate PPE. Movement between zones will be controlled at checkpoints.

Considerable judgment is needed to maintain a safe working area for each zone, balanced against practical work considerations. Physical and topographical barriers may constrain ideal locations. Field measurements combined with climatic conditions may, in part, determine the control zone distances. Even when work is performed in an area that does not require the use of chemical-resistant clothing, work zone procedures may still be necessary to limit the movement of personnel and retain adequate site control.

10.2 Site Security

Personnel and vehicle entry into the aforementioned work zones will be restricted by the SHSS or their designee. The SHSS or his/her designee will be responsible for site security while the designated site operations are being conducted. Site security at all other times will depend on site conditions and will be determined by the PM and/or client. Site security procedures include, but are not limited to the limiting of site access to authorized personnel only.

The SHSS will ensure that visitors entering work zones under the direction and control of SET have the appropriate training, and have read this SHSP. The SHSS will keep a daily security log including entry/exits log, vehicle log, results of security checks, and details of any security problems.

10.3 Decontamination Procedures

Decontamination procedures will be implemented as necessary by the SHSS to protect personnel from hazardous substances that may contaminate and/or eventually permeate protective clothing, respiratory protection equipment, tools, vehicles, and other equipment used onsite; and to minimize the transfer of harmful materials into clean areas; to prevent mixing of incompatible chemicals; and to protect the community by preventing uncontrolled transportation of contaminants from the site.

10.3.1 Personnel Decontamination

Personnel may encounter potentially hazardous compounds while performing work tasks. If so, decontamination needs to take place using an Alconox wash, followed by a rinse with clean water. Standard decontamination procedures for levels C and D are as follows and take place inside the Contamination Reduction zone unless otherwise noted:

- Equipment and tool drop inside the exclusion zone;
- Boot cover and outer glove wash and rinse inside the exclusion zone;
- Boot cover and outer glove removal;
- Suit wash and rinse followed by suit removal;
- Inner glove wash and rinse;
- Respirator removal;
- Inner glove removal; and
- Field wash of hands and face inside support zone.

Workers should employ only those steps that are applicable with level of PPE worn and extent of contamination present and the SHSS will provide site-specific guidance on the required decontamination procedures. The SHSS will maintain adequate quantities of clean water to be used for personal decontamination *(i.e.*, field wash of hands and face), secondary containment (i.e. plastic tarps) and wash and rinse containers (i.e. buckets, wading pools etc.). PPE, wash and rinse solutions that are contaminated with site hazards will disposed of as hazardous waste in appropriate containers. Non-disposable items may need to be sanitized before reuse. Each site worker is responsible for the maintenance, decontamination, and sanitizing of their own PPE.

10.3.2 Equipment Decontamination

In certain circumstances, field equipment and vehicles may require decontamination as follows:

- An equipment decontamination pad or area shall be designated for cleaning large equipment;
- All sampling devices will be decontaminated by scrubbing or wiping a decontamination solution such as Alconox and water on the device. A clean water rinse shall be applied;
- Tools that are difficult to decontaminate will be kept in the exclusion zone and handled only by workers using the appropriate PPE;

- Following decontamination of equipment using steam cleaning, a final steam/water rinse shall be applied;
- The spent solutions, wash materials, brushes, and the like shall, until shown otherwise, be considered contaminated and so treated; and,
- All porous equipment, which is believed to be contaminated, shall be disposed of as hazardous waste.

Each worker must follow the above procedures to prevent the transport of chemically affected materials offsite.

11. EMERGENCY RESPONSE PROCEDURES

Emergency situations can include: a fire or explosion, an environmental release, damage of an underground conduit during excavation or drilling or accident or injury to one of the field personnel. In the event of an emergency, site personnel will signal distress with three blasts of a horn (a vehicle horn will be sufficient). At the sound of three horn blasts, other personnel onsite must immediately come to the assistance of the person honking. For incidents such as a fire or explosion or major release of hazardous gas, evacuation of the work area will be completed. The SHSS/PM and/or their designee will be notified immediately in the event of an evacuation.

11.1 Incident Reporting Procedure

The quick and accurate transfer of information to all appropriate personnel is critical in the event of an emergency. The SHSS will coordinate all initial emergency response activities until relieved by the appropriate chain of command (i.e. PM, fire department, hazmat, police, client etc.).

To simplify the response procedure, an emergency can be reported by simply dialing 911. This approach can also be used for incidents requiring police or fire department assistance, or for medical emergencies.

When making such a 911 call, be sure to give the following information to the dispatcher:

- Your name, *i.e.*, "John Smith."
- The nature of the incident, *i.e.*, "Fire."
- The location of the incident, *i.e.*, "Street location and nearest intersection. The more specific you can make the address, the better.
- What you need, *i.e.*, "Fire Department & First Aid."
- If you are able, where you will meet emergency responders, *i.e.*, "At the front gate weigh station."
- If applicable, a call back number or your pager number, *e.g.*, "I'll be at the scene; my pager number is 123-4567."
- Is the situation stabilized? - *e.g.*, "I have the fire under control."
- Is anyone injured or in need of emergency assistance? - *e.g.*, "A mechanic working on a pump was burned."

11.2 Site Emergency Coordinator

The Site Emergency Coordinator is:

Ron Flury, cell phone: 310-922-5552

Alternate:

Jeff Sharp, cell phone: 310-505-3675

11.3 Fire or Explosion

In the event of fire or explosion, personnel should contact the local fire department immediately by dialing 911. When representatives of the fire department arrive, the SHSS, or designated representative, will advise the commanding fire officer of the location, nature, and identification of any hazardous materials onsite. Only trained, experienced fire fighters should attempt to extinguish substantial fires at the site. Site personnel should not attempt to fight fires, unless properly trained and equipped to do so.

11.4 Underground Utilities

In the event that an underground conduit is damaged during excavation or drilling, mechanized equipment will immediately be shut off until the nature of the piping that was damaged can be determined. Depending on the nature of the broken conduit (e.g., natural gas, water, or electricity), the appropriate local utility will need to be contacted.

11.5 Evacuation

The SHSS will designate evacuation routes and refuge areas to be used in the event of an emergency. Site personnel will stay upwind from vapors or smoke and upgradient from spills. If workers are in an exclusion or contamination reduction zone at the start of an emergency, they should exit through the established decontamination areas whenever possible. If evacuation cannot be done through an established decontamination area, site personnel will go to the nearest safe location and remove contaminated clothing there or, if possible, leave it near the exclusion zone. Personnel will assemble at the predetermined refuge following evacuation and decontamination. The SHSS, or designated representative, will count and identify site personnel to verify that all have been evacuated safely.

11.6 Hazardous Material Spill

If a hazardous material spill occurs, site personnel should locate the source of the spill and determine the hazard it poses to the health and safety of site workers and the public. An attempt to stop or reduce the flow can be made, if it can be done without risk to personnel. Otherwise, the spill area should be isolated and entry by unauthorized personnel not allowed. All sources of ignition that are located within 100 feet of the spill, including vehicle engines, should be de-energized. If the spill is of such nature or extent that it cannot be safely contained, or poses an imminent threat to human health or the environment, an emergency cleanup contractor should be called as soon as possible. Additional spill containment measures are listed below.

- Containers may be up righted or rotated to stop the flow of liquids. This step should be accomplished as soon as the spill or leak occurs, providing it is safe to do so.
- Sorbent pads, booms, or adjacent soil may be used to dike or berm the spill, or to solidify liquids.
- Sorbent pads, soil, or booms, if used, should be placed in appropriate containers after use, pending disposal.
- Contaminated tools and equipment should also be collected for subsequent cleaning or disposal.

11.7 Communication Procedures

Emergency procedures listed in this plan are designed to give the field team instructions in handling medical emergencies, fires and explosions, and excessive emissions during the operational activities. These emergency procedures will be carefully reviewed with the field team during the health and safety training session.

Personnel in the exclusion zone should remain within sight of the SHSS.

Repeated horn blasts will be the emergency signal to indicate that all personnel should leave the exclusion zone.

The following standard hand signals will be used when vocal communication is not possible.

Hands gripping throat .... **Out of air, can't breathe**

Grip partner's wrist or both hands around waist .... **Leave area immediately**

Hands on top of head .... **Need assistance**

Thumbs up .... **OK, I am all right, I understand**

Thumbs down .... **No, negative**

11.8 Emergency Safety Equipment

The following emergency and first aid equipment will be made available at the project work zone and/or the contaminant reduction zone, as appropriate.

- Fire Extinguishers with multipurpose dry chemical (rating of 20-A:120-B:C);
- Cell phone with extra battery;
- Industrial first aid kit; and
- Portable eye wash solution.

11.9 Directions to Hospital

LA County Harbor-UCLA Medical Center
1000 West Carson Street, Torrance, California
310-222-2345

To reach the hospital from the site:

1. Start out heading south on Normandie Avenue and proceed for 0.7 miles,

2. Turn left (east) on West Carson Street and proceed for 0.4 miles,

3. Turn right (south) for 141 feet,

4. Turn left (east) for 243 feet,

5. The hospital is on the right (south) after 233 feet.

Directions to the hospital and a route map are provided in Section 1.3 of this SHSP.

12. SAFE WORK PRACTICES

To maintain strong safety awareness and enforce safe procedures, the following personnel requirements and prohibitions have been established for the site:

- The work area will be restricted to authorized visitors and personnel. Daily tailgate safety meetings will be held on a daily basis at the beginning of each shift to discuss site conditions, field tasks being performed, planned modifications, and work concerns.
- All personnel entering the site will be required to identify themselves to the SHSS. Personnel who have not attended a tailgate safety meeting on that day will be required to do so with the SHSS or other authorized representative. Personnel unfamiliar with the site will be informed of site hazards and instructed to avoid contact with contaminated surfaces, soils, sample materials, or related equipment, and will be instructed to remain a minimum of 50 feet (15.3 m) upwind of all active work areas.
- All personnel will adhere to the decontamination procedures outlined in this SHSP.
- Removal of materials from protective clothing or equipment by blowing, shaking, or any other means that may disperse contaminated materials into the air is prohibited.
- Legible precautionary labels will be affixed to containers of raw materials, intermediate products, mixtures, waste debris, and contaminated PPE.
- Contaminated PPE will not be removed from the site until it has been cleaned or properly packaged and labeled.
- Hands will be thoroughly washed upon leaving contaminated or suspected contaminated areas before eating, drinking, or other such activity.
- All hazardous wastes, soil samples, and other contaminated materials, which are removed from the site, will be accompanied by appropriate shipping papers.
- No running or horseplay.
- Medicine and alcohol can worsen the effects from exposure to toxic chemicals. Prescribed drugs will not be taken by personnel on operations where the potential for absorption, inhalation, or ingestion of toxic substances exists, unless specifically approved by a qualified physician. Alcoholic beverage intake will not be allowed during breaks.
- Safety devices on equipment must be left intact and used as designed.
- Equipment and tools will be kept clean and in good repair, and used only for their intended purpose.
- Respiratory devices may not be worn with beards or long sideburns, or under other conditions that prevent a proper seal.
- Accidents and/or injuries associated with work at the site will be immediately reported to the SHSS. If necessary, an incident report will be initiated by the SHSS.
- The “buddy system” will be used whenever appropriate.
- To prevent head injury, ANSI-approved hard hats will be worn at all times while workers are in areas where overhead obstructions or falling objects may be encountered.
- To prevent eye injuries, workers must wear ANSI-approved safety glasses during field activities.

13. SITE SAFETY CHECKLIST

Site Safety Checklist	Yes	No	N/A	Remarks
Written Site Health and Safety Plan (SHSP) is onsite				____________
SHSP has been read and signed by all site personnel including visitors				____________
Daily tailgate safety meetings have been held and documented				____________
Site personnel have appropriate training and medical clearance				____________
Site zones are set up and observed where appropriate				____________
Access to the work area limited to authorized personnel				____________
Decontamination procedures are followed and match the requirements of the SHSP				____________
Decontamination stations (including hand/ face wash) are set up and used				____________
Personal Protective Equipment (PPE) used matches SHSP requirements				____________
Hearing protection used where appropriate				____________
Respirators are properly cleaned and stored				____________
Emergency and first aid equipment is onsite as described in SHSP				____________
Drinking water is readily available				____________
Phone is readily accessible for emergency use				____________
Proper drum and material handling techniques are used				____________
Drums and waste containers are labeled appropriately				____________
Extension cords are grounded and protected from water and vehicle				____________
Ground-fault circuit interrupters are used with electrical equipment				____________
Tools and equipment are in good working order				____________
Lighting is adequate				____________

14. TAILGATE SAFETY MEETING

Instructions: To be completed by supervisor prior to start of new job, when changes in work procedures occur, or when additional hazards are present.

Project no. & name: ______________________ **Task no.** ____________

Project address: ______________________ **Date:** ____________

Work activity: ______________________ **Time:** ____________

Safety topics/hazards discussed:

____

____

____

____

Informal training conducted (name, topics):

____

____

____

____

____

Attendee names and signatures:

Supervisor's signature and date: ______________________

15. NEAR-MISS REPORT

Project no. & name: ______________________________ Task no. ____________

Project address: ____

Date/time of near-miss: ____

Name of Preparer: ______________________________ Date: ____________

The following is an account of what happened:

I believe this could have resulted in injury and/or damage to (check all that apply): ☐ Personnel ☐ Property ☐ Equipment If these circumstances occurred:

I recommend the following actions to prevent this from occurring in the future:

REVIEWED BY:

Project Manager: ______________________________ Date: ____________

Site Health and Safety Supervisor: ______________________________ Date: ____________

16. EMPLOYEE'S REPORT OF INJURY

(To be completed by employee only)

Employee name: ______________________________ Male _____ Female _____
Last First Middle

Date of birth: ____________________ Home phone: ( ) ____________

Home address: ______________________________

City: ____________________ State: ________ Zip code: __________

Present title: ____________________ AA&A employee since: ____________

Social Security no.: ________ – ________ – ________ Weekly salary: ____________

Accident location: ______________________________
Address Area (loading dock, bathroom, etc.)

Date of accident: ____________________ Time of accident: ____________

Describe fully how accident occurred (including events that occurred immediately before accident):

____

Describe bodily injury sustained (be specific about body part[s] affected):

____

Recommendation on how to prevent this accident from recurring: ____________

____

Name of supervisor: ______________________ Phone: ____________
Last First

Name(s) of witness(es): ______________________ Phone: ____________
(Attach report[s] of witness[es])

When did you report the accident to your supervisor? ____________________

To whom did you report the injury? ____________________

Do you require medical attention? Yes _____ No _____ Maybe _____

Name of your treating physician: ______________________ Phone: __________

Employee signature: ______________________ Date: __________

17. ACCIDENT WITNESS STATEMENT

(To be completed by accident witness)

Name of injured employee: ______________________________
Last First Middle

Name of witness: ______________________________ Phone: ______________
Last First Middle

Job title: ______________________________ SET employee (Y/N) since: ______________

Home address of witness: ______________________________

City: ______________________________ State: ________ Zip code ______________

Accident location: ______________________________
Address Area (loading dock, bathroom, etc.)

Date of accident: ______________________________ Time of accident: ______________

Describe fully how accident occurred (including events that occurred immediately before accident):

____

____

____

____

Describe bodily injury sustained (be specific about body part[s] affected): ______________

____

____

____

Recommendation on how to prevent this accident from recurring: ______________

____

Name of witness's supervisor: ______________________________ Phone: ______________
Last First

Witness signature: ______________________________ Date: ______________

18. SUPERVISOR'S ACCIDENT INVESTIGATION

(To be completed by employee's supervisor or other responsible administrative official)

Location where accident occurred		Employer's premises: Y ☐ N ☐ Jobsite: Y ☐ N ☐	Date of accident or illness
Who was injured?		☐ Employee ☐ Non-employee	Time of accident AM ☐ PM ☐
Length of time with firm	Job title or occupation	Dept. normally assigned to	How long has employee worked at job where injury or illness occurred?
What property/equipment was damaged?			Property/equipment owned by:
What was employee doing when injury/illness occurred? What machine or tool was being used? What type of operation?			
How did injury/illness occur? List all objects and substances involved.			
Part(s) of body affected/injured?		Any prior physical conditions? If so, what? Y ☐ N ☐	
Nature and extent of injury/illness and property damaged (be specific)			

Supervisor's corrective action to ensure this type of accident does not recur: ______________________

____

____

____

Was employee trained in appropriate use of personal protective equipment/proper safety procedures? Y ☐ N☐
Was employee cautioned for failure to use personal protective equipment/proper safety procedures?... Y ☐ N☐
Did employee promptly report the injury/illness? .... Y ☐ N☐
Is there modified duty available? .... Y ☐ N☐

19. APPROVAL / DISTRIBUTION OF SITE HEALTH AND SAFETY PLAN

Position	Name	Signature
Project Manager Tel: 310-505-3675	Jeff Sharp	______________________
Site Health and Safety Supervisor Tel: 562-833-5609	Jim Porter	______________________

The following have read this plan and understand its provisions:

Company	Name	Signature	Date

20. ACKNOWLEDGMENT OF POTENTIAL CHEMICAL HAZARDS

The companies identified below shall be responsible for the implementation of their own health and safety plans. Each member of the companies shall be 40-hour trained per 29 CFR 1910.120, including annual refreshers.

SET used a general knowledge of site history or specific data from prior site investigations to identify potential chemical hazards, which may be present at the site. Specific chemical criteria used by SET and provided to the company are shown below.

Chemical Criteria	Range in Concentration

SET's health and safety monitoring and communication to the subcontractors will be limited to the following information:

- vapor concentrations in breathing space
- dermal protection

Company	Name (print)	Signature	Date

By signing above, the subcontractors acknowledge that they have their own SHSPs in effect on this project. The subcontractors' SHSPs cover their own procedures, over which SET has no control. However, SET will advise subcontractors of any environmental conditions (such as vapor concentrations) which are monitored by SET.

FORMS

As Needed

APPENDIX C

Quality Assurance Project Plan

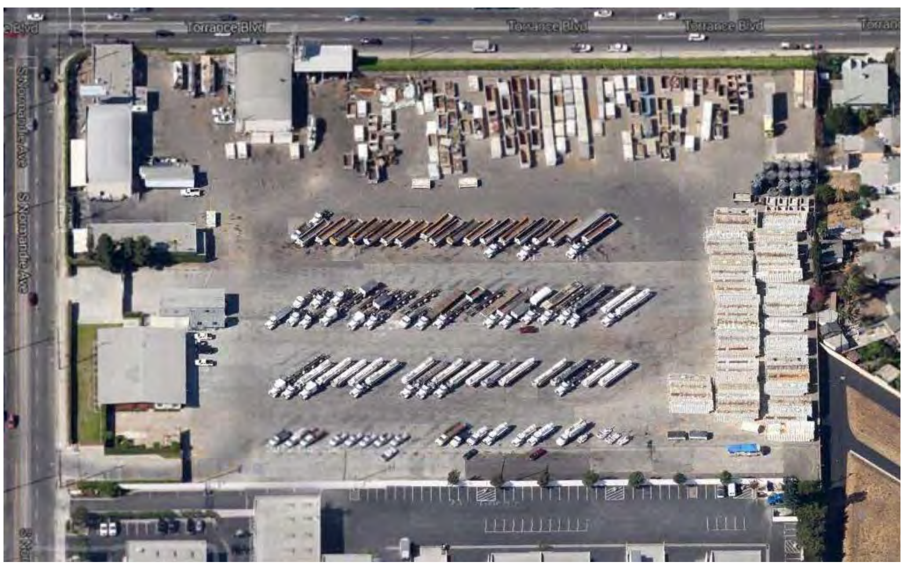
Sharp
Environmental
Technologies, Inc.

839 S. Beacon Street, #1967, San Pedro, California 90733 Tel (310) 505-3675 Fax (310) 548-3935

QUALITY ASSURANCE PROJECT PLAN

ECOLOGY CONTROL INDUSTRIES

20846 Normandie Avenue
Torrance, California 90502



Prepared for

MR. RON FLURY
ECOLOGY CONTROL INDUSTRIES
20846 Normandie Avenue
Torrance, California 90502

January 27, 2016

PROFESSIONAL CERTIFICATION

This plan has been prepared by

Jeffrey E. Sharp, PG, CEG
Supervising Geologist
Certified Engineering Geologist

TABLE OF CONTENTS

1. INTRODUCTION

This *Quality Assurance Project Plan* (QAPP) identifies the appropriate controls and responsibilities to ensure that collection and evaluation of field data throughout the soil stockpile removal activities, as outlined in Sharp Environmental Technologies, Inc.'s, (SET's) *Soil Stockpile Removal Work Plan* (hereinafter referred to as the "work plan"), are carried out in a scientifically valid and defensible manner. United States Environmental Protection Agency (USEPA or EPA) policy requires a QAPP for all environmental data collection projects mandated or supported by the USEPA through regulations or other formalized means. The purpose of this QAPP is to identify the methods to be employed to establish technical accuracy, precision, and validity of data that is generated at the site.

The objective of the work is to remove and dispose of four soil stockpiles of impacted soil located near and along the eastern portion of the Ecology Control Industries (ECI) property. The stockpiles were generated during remedial excavation activities conducted at the site in 2015 under a voluntary cleanup agreement between ECI and Department of Toxic Substance Control (DTSC). Characterization of the soil stockpiles indicated elevated levels of the contaminants of concerns (COCs) that may pose an imminent and substantial endangerment to public health or welfare or the environment. The soil stockpiles are currently stored on-site and are awaiting off-site transport and disposal pending the completion waste profiling and acceptance at an appropriate disposal facility.

This QAPP has been prepared in response to the USEPA Unilateral Administrative Order for Removal Action (UAO), CERCLA Docket No. 2016-01, to abate an imminent and substantial endangerment to the public health or welfare or the environment, which may be presented by the actual or threatened release of hazardous substances at or from the site associated with recent remedial activities. Refer to Appendix A for a copy of the UAO.

This QAPP is based on USEPA guidance and presents specific management, functional activities, and quality assurance and quality control (QA/QC) activities to achieve the data quality objectives presented in this QAPP. All field activities and sampling work to be conducted during the project will be performed by California-certified contractors with supervision of a Professional Geologist (PG) or a Professional Engineer (PE) registered in the State of California.

1.1 Recent Site Investigations

Recent assessment reports for the site include the following:

- *Environmental Site Assessment* (Haley & Aldrich, Inc. (HAI), 2005)
- *Draft Soil Investigation Report* (Earth Tech, 2006)
- *Summary Report - Human Health Risk Evaluation* (HAI, 2006)
- *Revised Soil Investigation Report, Historic Storm Water Pathway* (Earth Tech, 2008)
- *Final Human Health Risk Assessment* (Innovative Technical Solutions, Inc. [ITSI]
- *Phase II – Environmental Site Assessment* (SET, 2014)

SET's work plan is based on the findings, conclusions, and recommendations of these previous investigations.

2. PROJECT BACKGROUND

The site is located at Ecology Control Industries (ECI), 20846 Normandie Avenue in Torrance, California 90502. The work will be performed at the eastern property boundary within the ECI property identified as the historic storm water drainage channel.

The site consists of a 9.04-acre property currently occupied by ECI as a vehicle and equipment dispatch yard and a temporary hazardous and non-hazardous waste storage facility. The site contains one 5,400-square foot building located along the northern property line and is approximately 90 percent covered with either concrete or paved asphalt, with the remaining area consisting of unpaved soils.

Prior to approximately 1969, the historic storm water pathway in the vicinity of the ECI property was an unlined linear topographic depression that acted as a local surface drainage feature. The drainage channel passed under Torrance Boulevard and traversed the eastern portion of the ECI Property before continuing east through what is now the closed Royal Boulevard Landfill (ARMCO Site).

During the late 1960s and early 1970s, the drainage ditch was replaced by the Los Angeles County Flood Control District (LACFCD) with an underground concrete storm water conveyance system. Project No. 685 (also known as the Kenwood Drain), a concrete box culvert, replaced the historic storm water drainage ditch from 204th Street, along Kenwood Avenue, through the ECI property, and eventually emptying into the Torrance Lateral, a large, open, and concrete-lined drainage channel. The LACFCD maintains an easement for Project 685 within the properties it traverses, including the ECI property.

In 2005, pesticides and polychlorinated biphenyls (PCBs) were detected in soil by ECI as part of due diligence activities prior to sale of the property. The due diligence sampling activities detected several chemicals present in soils at concentrations exceeding residential action levels, including: dichlorodiphenyl-dichloroethane (DDD), dichlordiphenyl-dichloroethylene (DDE), dichlorodiphenyl-trichloroethane (DDT), chlordane, petroleum hydrocarbons, and PCBs. The sum of DDT, DDE, and DDD concentrations (referred to collectively as total DDT) were detected in subsurface soil samples collected from the eastern and southeastern portions of the ECI property in concentrations up to 325 mg/kg. Although contended by Montrose, EPA has attributed the presence of total DDT in these soils to former Montrose chemical manufacturing activities. From 1947 to 1982, Montrose manufactured technical grade DDT at a plant located approximately 0.5 miles north/northwest of the ECI property. EPA believes that DDT-impacted soils at the ECI property may be the result of contaminated storm water runoff from the former Montrose plant. The ECI property is located “down stream” from the former Montrose plant property, by way of the historical storm water drainage pathway.

Based on the data collected during previous investigations and the remedial excavation activities, preparation of a soil stockpile work plan was required by the EPA to address the removal of soils impacted with contaminants of concern that are currently stockpiled at the site.

This QAPP has been prepared as an Appendix and supplement to the *Soil Stockpile Removal Work Plan*.

3. PROJECT ORGANIZATION, RESPONSIBILITIES, TRAINING

A well-organized project team, combined with adequate experience and proper training, will help to assure consistent quality throughout the project. This section describes the key members and their responsibilities within the project team organization.

3.1 Project Organization

The project team involved with the work consists of the following:

- Senior project manager
- Project manager
- Quality assurance manager (QAM)
- Health and safety manager
- Site safety and health supervisor (SSHS)

3.2 Responsibilities

The specific responsibilities of the team members listed above are described in this section. One individual may assume more than one responsibility.

3.2.1 Senior Project Manager

The senior project manager oversees all project operations and delegates authority and resolves conflicts and problems. The senior project manager is a PG registered in the State of California or a PE and is responsible for the following:

- Ensuring that all contract requirements are met;
- Ensuring that the scope of work in the work plan and this QAPP are being implemented;
- Establishing initial scheduling of subcontractors and project schedule;
- Establishing and maintaining communication between the Client, the Agency, and the Project Team;
- Providing technical oversight, reviewing correspondence and e-mail communication, and reviewing the draft and final reports;
- Providing guidance to the project team as needed; and
- Performing duties of the project manager and QAM as needed.

3.2.2 Project Manager

The project manager manages the day-to-day activities in the field and is responsible for the following:

- Maintaining project budget and schedule;
- Establishing and maintaining communication between the Client, the Agency, and the Project Team;
- Implementing the data quality objectives (Section 4.2);
- Providing technical oversight and preparing correspondence, e-mail communication, and draft and final reports;
- Providing guidance to the project team and subcontractors, and acting as main contact to the subcontractors; and
- Performing duties of the QAM as needed.

The project manager is also responsible for implementing various aspects of the field program and providing necessary resources to the project team to allow adequate response to all requirements of the investigation. The project manager will direct all on-site activities, including those of subcontractors, and will ensure that all procedures described in the QAPP are adhered to in the field.The project manager will ensure that field equipment is properly calibrated and maintained, and that individual samples are properly handled and documented to allow tracing the possession and handling of the samples from collection to laboratory receipt. The project manager will also be responsible for the laboratory pickup and delivery schedules. Additionally, the project manager will be in contact with the senior project manager, as needed, to discuss questions and problems, as well as continually providing site progress information.

3.2.3 Quality Assurance Manager

Responsibilities of the project QAM will include, at a minimum:

- Ensuring that all field methods and sampling and QA protocols identified in the work plan and this QAPP are followed;
- Ensuring that all protocols described in the QAPP are met;
- Providing guidance or assistance and resolving problems on QA/QC topics;
- Verifying that the specified data collection methods comply with all QA/QC requirements and will yield data of desired quality and integrity;
- Reviewing, evaluating, and approving quality-related changes to the field sampling activities and QAPP and conducting field audits;
- Ensuring that all variations from the QAPP are identified and appropriate alternate actions are taken, and providing assistance to the project manager with regard to the scope of work;
- Communicating regularly with the project manager to ensure the progress of the QA tasks;
- Serving as the main contact for all project QA matters, and providing guidance on appropriate procedures to the project manager and support personnel;
- Conducting laboratory evaluations to ensure that analyses are performed in accordance with the QAPP;
- Coordinating with the laboratory and the project manager on QA/QC matters;
- Reviewing the draft laboratory data prior to issuance of the final laboratory report; and
- Coordinating data validation and review activities.

3.2.4 Health and Safety Manager

The project health and safety manager is responsible for developing, instituting, coordinating, and supervising the health and safety program on this project. The project health and safety manager's responsibilities include:

- Ensuring that the site health and safety plan (SHSP) complies with all federal, state, and local health requirements;
- Coordinating with the SSHS on all modifications to the SHSP and providing consultation, when required;
- Preparing materials to be used in the training program and ensuring that the SSHS is knowledgeable in all components of the SHSP;
- Conducting periodic on-site visits to verify that site personnel adhere to the site safety requirements;

- Establishing and maintaining communication between the SSHS and project manager; and
- Providing guidance on appropriate corrective action procedures to the project manager and support personnel.

3.2.5 Site Safety and Health Supervisor

The SSHS is responsible for implementation of the SHSP and has the authority to correct and change site control measures and the required health and safety protection. The SSHS has primary on-site enforcement authority, as delegated by the project manager, for the policies and provisions of the health and safety program and the SHSP. The SSHS will also hold daily tailgate health and safety meetings with all on-site subcontractors.

3.3 Subcontractors

The selected laboratory (Alpha Scientific Corporation of Cerritos, California) for analysis of soil samples provided a copy of their *Laboratory Quality Assurance Manual* that is included in Appendix B. The laboratory is certified by the State of California, Department of Health Services, to conduct analysis of environmental samples.

The prime laboratory for sample analysis will assume responsibility for providing all analytical services specified in the laboratory subcontracting agreement. Should it be agreed in writing that the laboratory may use an additional subcontract laboratory facility, the primary laboratory will supply to the project manager the standard operating procedures (SOPs) and QA plans from the other laboratory that is used upon request. The laboratory will be responsible for communicating all analytical guidelines and QC requirements of the project to this laboratory. Both QA Officers will monitor the data from each subcontract laboratory and correct any QC nonconformance.

All other subcontractors, including the transportation and disposal subcontractors, and waste disposal facility will be identified prior to the commencement of fieldwork.

3.4 Training

All personnel scheduled for work will be trained in compliance with the Occupational Safety and Health Administration (OSHA) requirements (29 Code of Federal Regulations [CFR] 1910.120). Personnel will be experienced in hazardous waste site work, use of personal protective equipment, and emergency response procedures.

All field personnel assigned to this project will receive a copy of the work plan, the SHSP, and this QAPP in a timely manner to allow for a sufficient review period. The on-site subcontractors will receive the SHSP as well as information from the work plan pertaining to their specific on-site duties. A field team orientation and briefing will be held prior to the initiation of fieldwork on each day to acquaint personnel with the site, assign field responsibilities, and familiarize personnel with any potential site hazards (e.g., traffic, electrical, mechanical, etc.).

4. PROJECT OBJECTIVES

4.1 Specific Project Objectives

The specific project objectives of the work are to load, transport and dispose of four soil stockpiles containing elevated concentrations of COCs. The soil stockpiles were generated during remedial excavation activities completed in 2015 under a voluntary cleanup agreement between the DTSC and ECI.

Soil sampling will be conducted to define the concentrations of COCs present in the soil stockpiles in accordance with EPA publication SW-846. As indicated in the work plan, the work will consist of a soil stockpile sampling program consisting of the collection of a minimum of 26 soil samples. The soil samples will be analyzed for one or more of the following constituents:

- Total petroleum hydrocarbons (full carbon chain) by EPA Method 8015;
- Volatile organic compounds (VOCs) by EPA Method 8260B;
- Polychlorinated biphenyls by EPA Method 8082;
- Organochlorine pesticides by EPA Method 8081A; and
- California Code of Regulations Title 22, California Assessment Manual (CAM) metals by EPA Method 6010B/7470A

The results from the sampling will be used to complete waste profiling applications and determine the most cost-effective transportation and disposal options.

4.2 Data Quality Objectives

Data quality objectives (DQOs) are qualitative and quantitative statements developed by data users to specify the quality of data needed from a particular data collection activity to support specific decisions or regulatory actions. Systematic planning should be integral to all stages of the project characterization through remediation. Systematic planning can be performed in a number of ways including the EPA DQO process. The seven-stage process for developing DQOs, as described by USEPA guidance, is based on the following:

1. State the problem.
2. Identify the decision.
3. Identify inputs to the decision.
4. Define the study boundaries.
5. Develop a decision rule.
6. Specify limits on decision errors.
7. Optimize the design for obtaining data.

The results of the first stage of the DQO development process for stating the problem are described in Section 4.1, above. The second stage is described in the work plan. The third stage of the process is the basis for preparing this QAPP and includes appropriate field techniques; appropriate analytical methods; and measurement objectives for precision, accuracy, representativeness, completeness, and comparability and are discussed in the work plan. The fourth stage is defining the study boundaries such as weather impacting field activities by rain or wind. The fifth stage is would recognize the future site requirements of with risk goals of cancer risk no greater than 106 and a hazard index no greater than 1. The sixth stage would consider the limits to be allowed error or deviation and the seventh stage provides a method for optimizing the delineation and analyze to improve project efficiencies.

4.3 Data Quality Assessment Criteria

The overall QA objective for this project is to develop and implement procedures for field sampling, chain-of-custody, laboratory analysis, and reporting that will provide results, which are scientifically valid and legally defensible. Specific procedures for sampling, chain-of-custody, laboratory instrument calibration, laboratory analysis, reporting of data, internal quality control, preventive maintenance of field equipment, and corrective action are described in the work plan and other sections of this QAPP.

All laboratory analyses will be performed using approved EPA methods, to include all QA/QC requirements. Additionally, 100 percent of the data will be validated by EPA Level II criteria to ensure reliable data of defensible quality. Field monitoring will be performed using instruments that have been calibrated at the beginning of each sampling day. Calibration information will be documented in the field logbook and/or calibration log.

4.3.1 Precision

Precision measures the reproducibility of repetitive measurements. It is strictly defined as the degree of mutual agreement among independent measurements as the result of repeated application of the sample process under similar conditions.

Analytical precision is a measurement of the variability associated with duplicate or replicate analyses of the same sample in the laboratory, and is determined by analysis of laboratory quality control samples, such as duplicate control samples, matrix spike duplicates, or sample duplicates. If the recoveries of analytes in the specified control samples are comparable within established control limits, then precision is within limits.

Total precision is a measurement of the variability associated with the entire sampling and analytical process. It is determined by analysis of duplicate or replicate field samples, and measures variability introduced by both the laboratory and field operations. Field duplicate samples are analyzed to assess field and analytical precision.

Duplicate results are assessed using the relative percent difference (RPD) between duplicate measurements. In general, the acceptance criteria for laboratory quality control samples (matrix spike/matrix spike duplicates [MS/MSD]) are dependent on the EPA method specified in Chapter 1 of EPA SW-846 (USEPA 1996, Final Update IV 2008). The acceptance criteria between primary and duplicate soil field samples will be five times the reporting limit, or less than or equal to an RPD value of 100. The RPD will be calculated as follows:

$$\text{RPD} = [(X_1 - X_2)/X][100]$$

where X_1 is the analyte concentration in the primary sample, X_2 is the analyte concentration in the duplicate sample, and X is the average analyte concentration of the primary and the duplicate sample $(X_1 + X_2)/2$.

Field precision will indicate information regarding sample acquisition, handling, preservation, shipping, storage, and if analyzed in the field, sample preparation, and analytical procedures.

4.3.2 Accuracy

Accuracy is a statistical measurement of correctness and includes components of random error (variability due to imprecision) and systematic error. It reflects the total error associated with a measurement. A measurement is accurate when the value reported does not differ from the true value or known concentration of the spike or standard.

Accuracy of laboratory analyses will be assessed by laboratory control samples (LCS), surrogate standards, MS/MSDs, and initial and continuing calibrations of instruments. Laboratory accuracy is expressed as the percent recovery (%R). Accuracy limits are statistically generated by the laboratory or required by specified EPA methods. The calculation of percent recovery is provided below:

$$\% R = 100(X_S - X)/T$$

where X_S is the measured value of the spiked sample, X is the measured value of the un-spiked sample, and T is the true value of the spike solution added.

Accuracy in the field is assessed through the use of field equipment blanks and adherence to all sample handling, preservation, and holding time requirements. Analysis of blanks will monitor errors associated with the sampling process, field contamination, sample preservation, and sample handling. A summary of container and preservation requirements for equipment blanks is provided as Table 3.

4.4 Representativeness

Representativeness is the degree to which data accurately and precisely represent selected characteristics of the media sampled. Representativeness of data collection is addressed by careful preparation of sampling and analysis programs. This QAPP, together with the work plan, addresses representativeness by specifying sufficient and proper numbers and locations of samples; incorporating appropriate sampling methodologies; specifying proper sample collection techniques and decontamination procedures; selecting appropriate laboratory methods to prepare samples; and establishing proper field and laboratory QA/QC procedures.

4.5 Completeness

Completeness is the amount of valid data obtained compared to the amount that was expected under ideal conditions. The number of valid results divided by the number of possible results, expressed as a percentage, determines the completeness of the data set. The field objective for completeness is to recover 100 percent of the planned field measurements and samples to support field efforts. Laboratory completeness is a measure of the number of valid measurements obtained from all the measurements taken in the project. The objective for laboratory completeness for this project will be 100 percent. The acceptance criteria for field and laboratory completeness are greater than 90 percent.

The formula for calculation of completeness is presented, as follows:

% Completeness = 100 (number of valid results/number of expected results)

4.6 Comparability

Comparability is an expression of confidence with which one data set can be compared to another. The objective of comparability is to ensure that data developed during the investigation are comparable to site knowledge and adequately address applicable criteria or standards established by the USEPA and the Cal/EPA. This QAPP addresses comparability by specifying field and laboratory methods that are consistent with the current standards of practice as approved by the USEPA and the Cal/EPA. Field and laboratory procedures are discussed in the work plan.

Field procedures are provided to ensure that tests performed at various locations across the site are conducted using accepted procedures, in a consistent manner between locations and over time, and include appropriate QA/QC procedures (i.e., instrument calibration) to ensure the validity of the data. Any limitations on the comparability of test data will be noted, and test results will be evaluated on that basis. Sampling procedures for environmental matrices are provided in the work plan to ensure that samples are collected using accepted field techniques and in a consistent manner between locations and over time.

All soil samples collected will be analyzed using consistent protocols for holding times, sample preparation, analytical methods, and QC as described in the approved EPA analytical procedures. Table 1 (Tables section) presents method, quantity, container, preservation requirements, holding time, and reporting and method detection limits for soil samples.

The data will be reduced, reported, and documented consistently throughout the study. All parameters for soil analytical data will be reported using a consistent set of units for each sample collected. Any deviations from established protocols will be noted in the report so that data comparability can be maintained. However, no deviations are anticipated at this time.

5. QUALITY CONTROL ELEMENTS

This section presents QC requirements relevant to assessment of field operations and analysis of environmental samples that will be followed during all project analytical activities. The purpose of the QC program is to produce data of known quality that satisfy the project objectives and that meet or exceed the requirements of the standard methods of analysis.

5.1 Assessment Oversight

This section presents the internal and external checks that have been built into this project to assure that:

- Elements of this QAPP and the work plan have been correctly implemented as prescribed;
- The quality of the data generated is adequate and satisfies the DQOs that have been identified in this QAPP; and
- Corrective actions, when needed, are implemented in a timely manner and their effectiveness is confirmed.

The project manager may also identify additional assessment activities to be performed during the course of the project based upon findings of the planned assessment activities described below.

In general, internal assessments of field operations will be conducted by the project manager and/or other designated members of the project team where appropriate. The assessment activities will evaluate field operations performance issues such as:

- Are sampling operations being conducted in accordance with the work plan?
- Are the samples labeled accurately?
- Are the chain-of-custody records complete and accurate?
- Are the field notes being completed accurately?

Planned assessment activities to evaluate these and other field operations performance issues include surveillance (frequent review) of sample collection documentation, sample handling records (chain-of-custody forms), field memoranda, and field measurements. Unannounced field operations audits may also be performed. The results of assessment activities will be reported to the project manager by the team member conducting the assessment activity. Assessment activity reports will include the findings and identification of corrective actions taken or planned.

5.2 Quality Control Procedures

It is critical that the chemical data be of the highest confidence and quality. Consequently, strict QA/QC procedures will be adhered to. These procedures include

- Adherence to strict protocols for field sampling and decontamination procedures;
- Collection and laboratory analysis of appropriate field equipment blanks to monitor for contamination of samples in the field or the laboratory;
- Laboratory analysis of MS/MSD, field duplicate, and equipment blank samples to evaluate analytical precision and accuracy; and
- Attainment of completeness goals.

5.3 Equipment Decontamination

Non-dedicated equipment will be decontaminated before and after each sample is collected. The equipment will be washed in a non-phosphate detergent (e.g., Alconox) and potable water, using a brush as necessary, rinsed in potable water, and then rinsed in distilled water. Decontamination of personal protective equipment (PPE) is addressed in the SHSP.

5.4 Standards

Standards used for calibration or to prepare samples will be certified by the National Institute of Standards and Technology (NIST), USEPA, or other equivalent source. The standards will be current. The expiration date will be established by the manufacturer, or based on chemical stability, possibility of contamination, and environmental and storage conditions. Standards will be labeled with expiration dates, and will reference primary standard sources, if applicable. Expired standards will be properly discarded.

5.5 Supplies

All supplies will be inspected prior to their use in the field or laboratory. The descriptions for sample collection and analysis contained in the methods will be used as a guideline for establishing the acceptance criteria for supplies. A current inventory and appropriate storage system for these materials will assure their integrity prior to use. Efficiency and purity of supplies will be monitored through the use of standards and blank samples.

5.6 Holding Time Compliance

Sample preparation and analysis will be completed within the required method holding time. Holding time begins at the time of sample collection (see summary of holding times in Table 1)**.** The following definitions of extraction and analysis compliance are used to assess holding times:

- Preparation or extraction completion – completion of the sample preparation process as described in the applicable method, prior to any necessary extract cleanup; and
- Analysis completion – completion of all analytical runs, including dilutions, second-column confirmations, and any required re-analyses.

5.7 Preventive Maintenance

The project manager is responsible for documenting the maintenance of all field equipment (e.g., photo-ionization detector [PID]) as prescribed in the manufacturer's specifications. Trained personnel will perform scheduled maintenance. Procedures specific to the calibration, use, and maintenance of field equipment are presented in the manufacturer's manual or specifications. The analytical laboratory is responsible for all analytical equipment calibration and maintenance as described in their laboratory QA plan. Subcontractors are responsible for maintenance of all equipment needed to carry out subcontracted duties.

6. QUALITY CONTROL SAMPLES

The purpose of this QA/QC program is to produce data of known quality that satisfy the project objectives and that meet or exceed the requirements of the standard methods of analysis. This program provides a mechanism for ongoing control and evaluation of data quality measurements through the use of QC materials. QA and QC samples will be collected as part of the overall QA/QC program.

6.1 Field Quality Control Samples

Field control samples for this work include duplicate samples as discussed below and summarized in Table 2.

6.1.1 Duplicate Samples

Duplicate field samples will be collected for the purpose of assessing the precision of the primary laboratory. Duplicate samples are collected in precisely the same manner as the original sample and are collected from the same location as the corresponding primary field sample. Agreement between duplicate sample results will indicate acceptable sampling and analytical precision. The precision goal for field duplicate analyses will be less than or equal to 100 percent RPD.

6.1.1.1 Duplicate Soil Samples

Field duplicate soil samples will be collected at a minimum frequency of one per 10 primary samples submitted to the laboratory.

6.1.2 Assessment of Field Contamination

Field contamination is assessed through the collection of equipment blanks and trip blanks. The strategy for the blank samples is designed to provide documentation on the efficacy of equipment decontamination procedures (equipment blanks) as well as identify cross contamination during sample handling or transportation (trip blanks).

6.1.2.1 Field Equipment Blanks

A field equipment blank is a sample that is prepared in the field by passing de-ionized or distilled water through or over the decontaminated sampling equipment used that day. The water is then collected and analyzed as a sample. The field equipment blank gives an indication of contamination from field procedures (i.e., cross-contamination). Field equipment blanks will be collected at a minimum frequency of one per day when sample collection equipment is decontaminated in the field. The field equipment blanks will be analyzed using the same analyses requested for the associated primary samples collected (Table 2). A summary of container and preservation requirements for equipment blanks is provided as Table 3.

The equipment rinse blanks will be preserved, packaged, and sealed in the manner described for the environmental samples. A separate sample number will be assigned to each sample and submitted blind to the laboratory.

6.1.2.2 Trip Blanks

Trip blanks will be prepared to evaluate if the shipping and handling procedures are introducing contaminants into the samples, and if cross contamination in the form of VOC migration has occurred between the collected samples. A minimum of one trip blank will be submitted to the laboratory for analysis with every shipment of samples for VOC analysis.

Trip blanks for soil samples are laboratory-preserved 40- ml vials free of VOCs and are shipped with the empty sampling containers to the site or sampling area prior to sampling. The sealed trip blanks are not opened in the field and are shipped to the laboratory in the same cooler with the samples collected for VOC analyses. The trip blanks will be preserved, packaged, and sealed in the manner described for the environmental samples. A separate sample number will be assigned to each trip sample and it will be submitted blind to the laboratory.

Trip blanks for soil samples are not required at this stage of the work. None of the soil samples will be shipped in containers. VOC analysis will be performed on-site immediately after sample collection.

6.2 Laboratory QA/QC Samples

Laboratory QA/QC samples that will be analyzed during the proposed implementation include method blanks, LCS, MS samples, and potentially laboratory duplicates. These are discussed below.

6.2.1 Laboratory Control Samples

A LCS is a known matrix that has been spiked with a known concentration of specific target analytes. It is used to demonstrate the accuracy of the analytical process. A LCS will be analyzed at a frequency of one per preparation or analytical batch not to exceed 20 samples.

6.2.2 Laboratory Reagent Blanks/Method Blanks

A laboratory reagent blank is deionized, distilled water that is extracted by the laboratory and analyzed as a sample. Analysis of the reagent blank indicates potential sources of contamination from laboratory procedures (e.g., contaminated reagents, improperly cleaned laboratory equipment, or persistent contamination due to presence of certain compounds in the ambient laboratory air). A reagent blank may be analyzed at least once each day for each method utilized by the laboratory for that day.

A laboratory method blank is clean soil or sand that is prepared or extracted by the laboratory and analyzed as a sample. Analysis of the method blank indicates potential sources of contamination from laboratory procedures. A method blank will be analyzed with each batch of samples for each method utilized by the laboratory.

6.2.3 Matrix Spike Samples

Matrix spikes are performed by the analytical laboratory to evaluate the efficiency of the sample extraction and analysis procedures, and are necessary because matrix interference (that is, interference from the sample matrix, water or soil) may have a widely varying impact on the accuracy and precision of the extraction analysis. The matrix spike is prepared by the addition of known quantities of target compounds to a sample. The sample is extracted and analyzed. The results of the analysis are compared with the known additions and a matrix spike recovery is calculated, giving an evaluation of the accuracy of the extraction and analysis procedures. Matrix spike recoveries are reviewed to check that they are within the laboratory's acceptable range. However, the acceptable ranges vary widely with both sample matrix and analytical method.

MS and MSDs (or LCS/laboratory control sample duplicates [LCSD], as applicable) will be analyzed by the laboratory at a frequency of at least one per 20 per batch. Typically, matrix spikes are performed in duplicate in order to evaluate the precision of the procedures as well as the accuracy. Precision objectives (represented by agreement between MS and MSD recoveries) and accuracy objectives (represented by matrix spike recovery results) are based on statistically generated limits established annually by the analytical laboratory. It is important to note that these objectives are to be viewed as goals, not as criteria. If matrix bias is suspected, the associated data will be qualified and the direction of the bias indicated in the data validation report.

A summary of all QA/QC samples to be collected in the field and analyzed in the laboratory is provided in Table 2.

6.2.4 Laboratory Duplicates

Duplicate samples are used to assess precision in the analytical method. An additional aliquot is extracted from a sample and analyzed using the identical procedures. The results are then compared to assess the precision. Duplicates may be of three kinds: LCSDs, MSDs, and laboratory sample duplicates. These duplicates are often used to evaluate and fulfill the precision DQO when there is matrix interference with the MS/MSD recoveries.

7. SAMPLING AND ANALYTICAL PROCEDURES

The defensibility of data is dependent on the use of well-defined, accepted sampling procedures. This section describes the sampling and handling procedures that will be followed for all soil samples.

7.1 Sampling Procedures

Collection of soil samples of high integrity is important to the quality of chemical data to be generated. To this end, strict field procedures have been developed as general descriptions of field methods that will be employed at various locations during phases of the field investigation. The procedures include

- Field sampling procedures;
- Sample containers, preservation and holding times;
- Sample packaging and shipment; and
- Sample documentation procedures.

The field sampling procedures for soil samples are identified in the work plan. The sample containers, preservation, and holding times are documented in Table 1 of this QAPP. The sample packaging, shipment, and documentation procedures are outlined below.

7.2 Sample Packaging and Shipment

To identify and manage soil samples obtained in the field, a sample label will be affixed to each sample container. The sample labels will include the following information:

- Project number;
- Site name;
- Sample identification (sample location number and depth);
- Date and time of collection; and
- Preservative, if any.

Following collection and labeling, soil samples for off-site analysis will be placed in a zipper-lock plastic bag and then immediately placed in a chilled sample cooler for temporary storage. The following protocol will be followed for packaging of soil samples to be analyzed off-site:

- A self-adhesive custody seal will be placed across the lid of each sample container.
- Samples to be shipped will be placed in the cooler and packed with packaging materials to minimize the potential for disturbance and/or breakage of the sample containers.
- Double-bagged ice will be placed in the coolers to keep samples at a chilled temperature during transport to the analytical laboratory.
- The chain-of-custody form will be placed in a water-resistant plastic bag and taped on the inside of the lid of the cooler.

Every effort will be made to transport the samples to the analytical laboratory at the end of each sampling day. However, if the sampling runs late and the laboratory is closed, the samples will be stored overnight in a secured location under appropriate chain-of-custody procedures, and the samples will be shipped to the laboratory the next day. Prior to overnight storage, the coolers will be restocked with new ice to maintain the samples in a chilled state.

7.3 Field and Sample Documentation

7.3.1 Field Logs

Site visitation reports will document where, when, how, and from whom any vital project information was obtained. Log entries for site visitation reports will be complete and accurate enough to permit reconstruction of field activities. All information will be legible, written in black or blue ink, and will be factual, objective, and free of personal opinions or other terminology that might prove inappropriate. If an error is made, corrections will be made by crossing a line through the error and entering the correct information. Corrections will be dated and initialed. No entries will be obliterated or rendered unreadable. Site visitation reports will be compiled in a field folder.

Entries in a site visitation report will include, at a minimum, the following for each site visitation:

- Site name, address or location, and date;
- Recorder's name;
- Time of site arrival/entry on site and time of site departure;
- Summary of any on-site meetings;

- Deviations from sampling plans and site safety plans;
- Changes in personnel and responsibilities as well as reasons for the changes;
- Levels of safety protection; and
- Calibration readings for any equipment used and equipment model and serial number.

At a minimum, the following information will be recorded in the site visitation report or chain-of-custody form during the collection of each sample:

- Sample identification number;
- Sampler's name;
- Date and time of sample collection;
- Sample container;
- Type of sample (i.e., matrix);
- Type of preservation;
- Type of sampling equipment used;
- Instrument readings (e.g., PID);
- Recipient laboratory; and
- Field observations and details important to analysis or integrity of samples (e.g., heavy rain, odor, color).

A field folder will include the following forms:

- Daily field reports;
- Field maps showing proposed soil sampling locations and site measurements;
- Copies of chain-of-custody records;
- Field equipment calibration readings; and
- Drum inventory records, if any.

7.3.2 Photographs

Photographs will be taken during field activities. They will serve to verify information entered in the field logbook. When a photograph is taken, the following information will be written in the field logs or will be recorded in a separate field photography log:

- Time, date, location, and if appropriate, weather conditions;
- Description of the subject photographed; and
- Name of person taking the photograph.

7.3.3 Chain-of-Custody Records

Chain-of-custody records are used to document sample collection and shipment to the laboratory for analysis. Chain-of-custody record forms will be provided by the laboratory and will accompany all sample shipments for analyses. Forms will be completed and submitted with the samples for each laboratory and each shipment. If multiple coolers are submitted to one or more laboratories on a single day, chain-of-custody forms will be completed and sent with the samples for each cooler. The chain-of-custody record will identify the contents of each shipment and maintain the custodial integrity of the samples. Generally, a sample is considered to be in someone's custody if it is either in someone's physical possession, in someone's view, locked up, or kept in a secured area that is restricted to authorized personnel. Until the samples are shipped, the custody of the samples will be the responsibility of SET. The project manager or designee will sign the chain-of-custody form in the "relinquished by" box and note date, time, and air bill number. A copy will be retained in SET's project files.

7.4 Analytical Procedures

The analytical methods used for this project are primarily USEPA-approved methods and are listed in the work plan. The target parameters, analytical methods, quantity, container, preservation requirements, holding time, and method detection limits are provided in Table 1.

7.4.1 Method Detection Limit

The MDL is the minimum concentration of an analyte, or compound, that can be measured and reported with 99 percent confidence that the concentration is greater than zero. MDLs are established for each method, matrix and analyte, and for each instrument used to analyze project samples. The MDLs established by the Cal/EPA will be applied for this project. The USEPA requires that MDLs be established on an annual basis. A list of MDLs for each compound is included with the laboratory's Quality Assurance Manual (Appendix B).

8. DATA MANAGEMENT

The objective of data management is to establish procedures to be used during the field investigations for documenting, tracking, and presenting investigative data. Data generated during the field investigations, as well as previously existing data, will be used to form the basis for conclusions and recommendations. Efficient utilization and comprehensive consideration of available data requires that the data be properly organized for review. Organization of the data shall be planned prior to actual collection to assure the generation of identifiable and useable data. This section contains procedures necessary to assure the collection of sufficient data for accurate validation of raw data and transfer of validated data to a data management system with which it can be evaluated with minimal effort. This section also describes the operating practices to be followed by personnel during the collecting and reporting of data.

8.1.1 Data Recording

Observations made and measurements collected in the field are recorded on appropriate data sheets or in field memoranda. Soil sample data will be summarized in tabular form in the reports and will include sample location and depth where applicable. Upon completion of the field investigation, the data will be entered into a spreadsheet and tabulated for evaluation and presentation in the reports. Copies of the selected original data records will be attached to the report as appendices. Data used for analysis, presentation, and reporting on the project will be stored in an electronic format to facilitate the following processes:

- Tracking chain-of-custody and sample identification data;
- Reviewing and evaluating analytical data against project-specific criteria; and
- Production of data tables.

Each set of chemical analytical data reported by the laboratory will be submitted as a complete and single, electronic data deliverable (EDD). It is expected that the laboratory will perform a comparison of electronic data with the hard copy report prior to submittal to ensure that the EDD and hard copy data are identical. SET will check the EDD against the hard copy for detected analytes. The EDD should be submitted on a diskette or via email and will be revised as necessary.

8.1.2 Data Verification

Data verification is an integral part of the QA program and consists of reviewing and assessing the quality of data. Analytical data submitted by the laboratory in EDD form will be verified and, if necessary, exception reports will be produced. Qualified results will be reflected in the reports.

8.1.3 Data Transmittal

The integration of field data is completed by entering the data from field forms into a spreadsheet format . The spreadsheet is reviewed for completeness and accuracy by a geologist or engineer by comparing the electronic spreadsheet to the original field data. Analytical laboratory data are provided in both a hard copy and in EDD format. The electronic data are provided in a specified format that will be uploaded to intermediate files, reviewed for completeness and accuracy by the project manager before use by the project team.

8.1.4 Data Tracking

The project manager is ultimately responsible for activities conducted for this project, including data management. The project manager has the authority to enforce proper procedures as outlined in this plan and to implement corrective procedures to assure the accurate and timely flow and transfer of data. The project manager will review the final data reports.

Data will be generated from the geological investigations (drilling and sampling) and environmental sampling and analysis. The generators of data (geologists, samplers, and chemical analysts) will be responsible for accurate and complete documentation of data required under the task, and for assuring that these data are presented to their supervisor in a timely manner.

The project manager will be responsible for the day-to-day monitoring of data collected in the field. He/she assures that data are collected in the format specified in the task's work plan, assigns sample designations, and routes data to the project files. At least one copy of project documents will be retained by the project manager for use during the investigation. Original documents will be maintained in the project file.

The project manager will be responsible for the day-to-day monitoring of activities related to the generation and reporting of chemical data. The project manager ensures that samples are analyzed according to the specified procedures; that data are verified; and that the data are properly coded, checked for accuracy, and entered into the data management system. The project manager assures the data are then routed to the project files.

8.1.5 Data Storage and Retrieval

A project file will be established for the storage of original data, historical data, written documents, and data collected or generated during this work. SET maintains a central filing system in which the project file will be located. Documents relating to the project shall be controlled to assure proper distribution, filing, and retrieval. The document control shall also assure that revisions are properly recorded, distributed, and filed. The project manager maintains overall responsibility for the project files and assures that appropriate documents are filed. Once filed, documents are available to SET staff and may be removed from file for use by signing out the material.

9. INSTRUMENT OPERATION AND CALIBRATION PROCEDURES

9.1 Field Equipment Calibration Procedures and Frequency

Calibration procedures and operational and maintenance procedures of the instruments are specified in the manufacturers' instructions. All field equipment will be checked for proper operation and calibrated daily at the site prior to use. Equipment that operated improperly will be replaced as needed. A list of equipment used, calibration, service, and repairs (if applicable) will be documented in the site visitation report.

9.2 Laboratory Instrument Calibration

Analytical instruments will be calibrated in accordance with the procedures specified in the applicable method. All analytes that are reported must be present in the initial and continuing calibrations, and these calibrations must meet the acceptance criteria specified in the reference method. Records of standard preparation and instrument calibration will be maintained. Records will unambiguously trace the preparation of standards and their use in calibration and quantitation of sample results.

At the onset of analysis, instrument calibrations will be checked using all of the analytes of interest. This applies equally to multi-response analytes. At a minimum, calibration criteria will satisfy method requirements. Analyte concentrations can be determined with either calibration curves or response factors, as defined in the method. Guidance provided in SW-846 should be considered to determine appropriate evaluation procedures. The calibration data will be available upon request. Laboratory instrument and equipment calibration procedures and preparation of calibration standards are included in the laboratory subcontractor's QA manuals (Appendix B).

10. INTERNAL QUALITY CONTROL CHECKS

10.1 Field Quality Control Checks

QC procedures will include calibrating the instruments, and checking the reproducibility of the measurements by taking multiple readings on a single sample or reference standard.

10.2 Laboratory Quality Control Checks

The laboratories utilized in this project will have QC programs that are established to ensure the reliability and validity of the analysis performed at the laboratories. All analytical procedures are documented in writing as laboratory SOPs, or in respective EPA-approved methods, and each SOP or method includes a QC section that addresses the minimum QC requirements for the procedure. The internal QC checks might differ slightly for each individual procedure.

All data obtained will be properly recorded. The data package will include a full package capable of allowing the recipient to reconstruct QC information and compare it to QC criteria. Any samples analyzed in nonconformance with the QC criteria will be reanalyzed by the laboratory, if sufficient volume is available. It is expected that sufficient volumes/weights of samples will be collected to allow for reanalysis when necessary.

11. DATA QUALITY ASSESSMENT AND REPORTING

This section presents reporting requirements relevant to the data produced during all project analytical activities.

11.1 Data Reduction

Recording of field data is discussed in Section 7.3.1. Field data and chain-of-custody records will be reviewed by the project manager to evaluate completeness of the field records and appropriateness of the field methods employed.
All data produced during the investigation will be organized as tables of analytical results and stored in the project contractor's computer network system, as part of the project file reports. Hard copies of all analytical data will be stored in the project file.

Soil analytical results will be reported in micrograms per kilogram (µg/kg) or mg/kg. The procedures used to calculate concentrations will be the same as those specified in each analytical methodology used. Internal data reduction procedures by the laboratories will be performed in accordance with the laboratory QA manuals.

11.2 Data Validation

Field data validation will be accomplished by the QAM or equivalent. All laboratory data will be validated by the laboratory analyst, the laboratory QA/QC officer, and laboratory director. All field and laboratory data will be reviewed by the QAM (or designated staff) for completeness and accuracy and to determine whether the DQOs have been met. A preliminary review upon initial receipt of data will be performed to verify that all necessary paperwork (chain-of-custody forms, analytical reports, laboratory personnel signatures) and deliverables are present. Appropriate equations for precision, accuracy (bias), and completeness will be used for all analyses.

When the review has been completed, the QAM will submit the validated data to the project manager for subsequent evaluation and interpretation. If field or laboratory data are determined to be unusable, corrective action will be implemented as outlined in Section 13 of this document.

11.3 Data Deliverables

Analytical data will be summarized in tabular form by sample number, sample matrix description, parameters analyzed and their corresponding detected concentrations, and the detection limits. All analytical data manually entered into tables will be checked by the QAM to verify that the entered data are correct. The laboratory will be required to generate data packages that will provide all the necessary information for validation and use standard reporting forms for all data reporting.

The deliverables required for this project are in both hardcopy and electronic format. These formats are described below.

11.3.1 Hardcopy Data Deliverables

Complete Level II data packages may be required. The laboratory will be expected to provide data results (PDF format) in 10 working days and full Level II packages 20 workings days from the time of receipt of samples, as required.

11.3.2 Electronic Data Deliverables

To facilitate data handling and management, laboratory data may be entered into a computerized format. All data entered into the electronic data files will correspond identically to the data contained in the original laboratory reports and other documents associated with sampling and the laboratory hardcopy data deliverable packages. The format of the electronic data deliverable will be arranged between the SET project manager and the laboratory data management personnel.

11.3.3 Other Data Deliverables

The results from the sampling activities will be incorporated into the work as data tables and figures showing sampling locations and analyte concentrations (as applicable). The entire report will include an executive summary, site description, and background including current and previous site uses, summary of prior environmental assessments, environmental setting including local and regional geology and hydrogeology, identification of local subsurface aquifers and distances to nearest water production wells, a description of the field procedures, discussion of the soil and soil-gas sampling results including tabulated summary of laboratory analytical results, and conclusions and recommendations.

It is intended that data collected through implementation of this QAPP will satisfy the requirements of the USEPA and Cal/EPA. These data will be used to evaluate extent and concentrations of the COCs to determine further investigation and remediation in consultation with the USEPA and Cal/EPA.

The draft report will initially be prepared by the project manager. Figures will be prepared by the field geologist and drafting technician and reviewed by the project manager. The report will then be reviewed by the technical editor (for syntax, grammar, and report formatting), the QAM, and the senior project manager. All information duplicated in text, tables, and figures will be reviewed for accuracy by the QAM.

12. AUDITS

Performance and system audits may be conducted by the QAM or his designated representative, if requested by either the USEPA or the Cal/EPA, to ensure that the procedures used to conduct field operations and laboratory analyses are properly followed. The Cal/EPA may conduct an audit of either field or laboratory activities. The QAM will formulate corrective action acceptance reports and audit reports, and coordinate the recommended actions with the laboratory manager. Results of both the field and laboratory audits will be submitted to the project manager for review and incorporated into the reports. If the results of the audit necessitate further action, the Cal/EPA will be notified and will be apprised of any action taken.

12.1 Field Audits

Field audits may be conducted during the field investigation to evaluate appropriateness of personnel assignments and expertise; availability of field equipment; and adherence to the work plan and this QAPP for sample collection and identification, sample handling and transport, use of QA samples, chain-of-custody procedures, equipment decontamination, and documentation. An audit checklist will be prepared and completed. All nonconformance items will be documented and addressed. A written report or memorandum will be prepared for each audit and retained by the QAM and the project manager. The report will address adherence to the SOPs for sample collection, preparation, preservation, shipment, equipment decontamination, and the inspection of field equipment. Field audits are not required but may be performed in the event significant discrepancies are identified that warrant evaluation of field practices.

12.2 Laboratory Audits

To ensure that the laboratory is adhering to the QA/QC requirements established for this project, the QAM or a designated representative may conduct a laboratory audit during the investigation, if requested by either the USEPA or the Cal/EPA. The laboratory system audit will be conducted by visiting and examining all sections of the laboratory that are pertinent to the analysis of project-related analyses. After the visit, an audit report or memorandum will be generated, and the results will be evaluated to ensure acceptable laboratory performance. Performance audits for the laboratory activities may be carried out periodically during the investigation if the initial audit demonstrates major QC problems. Blind field duplicates will be sent to the laboratory for analysis to determine the data accuracy, precision, and completeness.

Laboratory audits include reviews of sample handling procedures, internal sample tracking, SOPs, analytical data documentation, QA/QC protocols, and data reporting. The selected mobile or off-site laboratory will be licensed by the State of California as a certified testing laboratory.

12.3 Data Audits

Data audits will be conducted on analytical results received from the laboratories. These audits will be accomplished through a process of data validation and review of laboratory analytical results. Data audits may require the laboratory to submit complete raw data files for validation. A detailed review of sample data may be performed, including verification of data calculations for calibration and quality control samples to assess whether these data are consistent with method requirements. Upon request, the laboratory will make available all supporting documentation in a timely fashion.

13. CORRECTIVE ACTION

Corrective action is the process of identifying, recommending, approving, and implementing measures to counter unacceptable procedures or out-of-QC performance that can affect data quality. Corrective actions will be initiated whenever data quality indicators suggest that DQOs have not been met. Corrective action can occur during field activities, laboratory analyses, data validation, and data assessment. Corrective action in the field may be needed when the scope of work is changed (e.g., significant increase or decrease of number of samples, sampling locations other than those specified in the work plan, sampling procedures and/or field analytical procedures require modification, etc.) due to unexpected conditions.

Corrective action in the laboratory may occur prior to, during and/or after initial analyses. A number of conditions may be identified during the analysis, from sample log-in to data review, that warrant corrective action. The bench chemist will identify the need for corrective action. The laboratory manager, in consultation with group supervisors and staff, will approve the required corrective action for the laboratory project. These corrective actions will be carried out before the data are released from the laboratory. The corrective action will be documented on an appropriate laboratory corrective action form (signed by the laboratory manager).

All corrective action proposed and implemented should be documented in the regular quality assurance reports to management. Corrective action should be implemented only after approval by the project manager, or his/her designee. If immediate corrective action is required, approvals secured by electronic mail or telephone should be documented in an additional memorandum.

For noncompliance problems, a formal corrective action program will be determined and implemented at the time the problem is identified. The person who identifies the problem is responsible for notifying the project manager, who in turn will notify the USEPA. Concurrence and implementation of corrective action will be confirmed in writing through the USEPA and the Cal/EPA.

14. FINAL SAMPLE DISPOSITION

Upon completion of all required analyses and acceptance of the data reported, the laboratory will be responsible for proper disposal of any remaining samples, sample containers, shipping containers, and plastic packing materials in accordance with sound environmental practice, based on the sample analytical results. Unused samples and containers found to be nonhazardous generally will be disposed after 90 days following completion of the analysis. At 90 days, the laboratory will contact the project manager to obtain approval for the samples to be disposed. In cases where the data package meets the project QA/QC requirements and no apparent anomalies are present in the data set, the project manager may authorize the laboratory to dispose of the samples at an earlier date. The laboratory shall maintain proper records of waste disposal and shall have disposal company contracts on file for inspection. All raw and processed data generated during the analysis of project samples must be stored for a period of five years. Revised copies of the applicable SOPs and QAPPs must also be maintained and available should the data be required. Should the laboratory go out of business, all original records related to project samples shall be provided to project personnel.

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12. EPA, *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*, Office of Emergency and Remedial Response, Washington, DC, October 1999, http://www.epa.gov/superfund/programs/clp/download/fgorg.pdf.

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TABLES

Tables 1 through 3

Table 1
Requirements for Soil Sample Analysis, Container, and Preservation

Target Parameter	EPA Method	Quantity	Container	Preservative	Maximum Holding Time	PQL	MDL
TPH(g) TPH (DRO) TPH (ORO)	8015M	1 x 6-inch	Acetate liner	4°C	14 days	TPH(g): 1 mg/kg TPH (DRO): 10 mg/kg TPH (ORO): 50 mg/kg	0.5 mg/kg 3 mg/kg 17 mg/kg
VOCs	8260B	2 x 5g 1 x 25g	En Core® sampler*	4°C	14 days**	VOCs: 2–50 µg/kg	0.38–12.7 µg/kg
PCBs	8082	1 x 6-inch	Acetate liner	Chilled with ice	14 days	33–67 µg/kg	1.22 µg/kg
Title 22 Metals	6010B/7471A	1 x 6-inch	Acetate liner	Chilled with ice	6 months	0.2–0.5 mg/kg	0.05–0.40 mg/kg
Lead†	6010B	1 x 6-inch	Acetate liner	Chilled with ice	2 months	0.25 mg/kg	0.10 mg/kg
PAHs	8310	1 x 6-inch	Acetate liner	Chilled with ice	14 days	2–100 µg/kg	2–100 µg/kg
OCPs	8081A	1 x 6-inch	Acetate liner	Chilled with ice	14 days	5–50 µg/kg	0.15–17 µg/kg
Ethylene glycol	8021B	1 x 6-inch	Acetate liner	Chilled with ice	14 days	10 mg/kg	10 mg/kg

PQL = Practical quantitation limit for undiluted samples, method detection limit same as PQL
MDL = Method detection limit
TPH(g) = Total petroleum hydrocarbons (gasoline-range organics)
TPH(DRO) = Total petroleum hydrocarbons (diesel-range organics)
TPH(ORO) = Total petroleum hydrocarbons (heavy oil-range organics)
VOC = Volatile organic compound
PCBs = Polychlorinated biphenyls
PAHs = Polycyclic aromatic hydrocarbons
OCPs = Organochlorine pesticides
µg/kg = Micrograms per kilogram
mg/kg = Milligrams per kilogram
* = Sample collection by EPA Method 5035, Update III of SW-846
** = Holding time is 14 days if samples are transferred into volatile organic ampoules (VOAs) preserved with sodium bisulfate within 48 hours of collection (samples will be submitted to the laboratory within 48 hours of collection). Holding time is 48 hours if samples are not transferred into VOAs.
† = Uppermost soil from core of acetate liner to be analyzed. Top of core to be labeled in the field.

Table 2
Quality Control Sample Requirements

Sample Type	Typical Frequency	Purpose
Field duplicate	1 per 10 samples	Evaluate precision of sampling and analysis procedures
Equipment blank (distilled water)	1 per set of equipment cleaned, collect one sample at the beginning of sampling and one each day after decontamination	Evaluate cross-contamination caused by non-dedicated equipment
Trip blank	1 per sample cooler containing VOCs	Evaluate VOC contamination introduced during sampling, storage, or shipment.
Field blank	1 per day	Evaluate contaminants introduced by ambient air during sample collection
Temperature blank	1 per sample cooler	Evaluate sample preservation
MS/MSD sample or LCS/LCSD (laboratory)	1 per 20 samples or 1 per analytical batch	Evaluate accuracy of analytical procedures
Method blank (laboratory)	1 per analysis, per day	Assess contamination introduced during sample preparation

VOC = Volatile organic compounds
MS/MSD = Matrix spike/matrix spike duplicate
LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

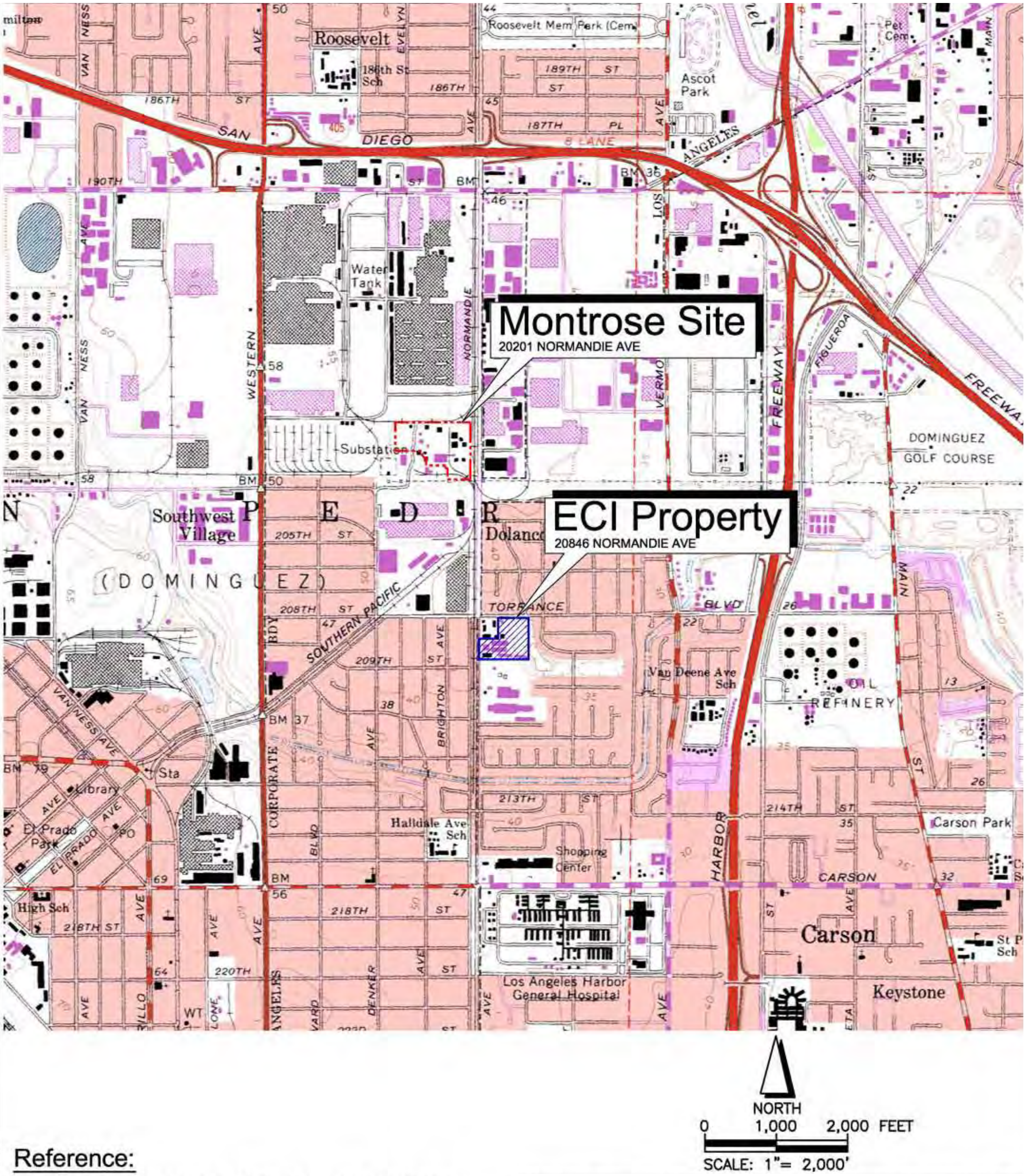
Table 3
Container and Preservation Requirements for Equipment Blank Water Samples

Target Parameter	EPA Method	Container	Preservative
TPH(DRO), TPH(ORO)	8015M	500-mL amber glass	Unpreserved
TPH(g) and VOCs	8260B	3 40-mL VOAs	4°C
PCBs	8082	1-liter amber glass	Chilled with ice
Title 22 Metals	6010B	500-mL plastic	Nitric acid
Lead	6010B	500-mL plastic	Nitric acid
PAHs	8310	1-liter amber glass	Chilled with ice
OCPs	8081A	1-liter amber glass	Chilled with ice
Ethylene glycol	8021B	3 40-mL VOAs	Chilled with ice

TPH(g) = Total petroleum hydrocarbons (gasoline-range organics)
TPH(DRO) = Total petroleum hydrocarbons (diesel-range organics)
TPH(ORO) = Total petroleum hydrocarbons (heavy oil-range organics)
VOC = Volatile organic compound
PCBs = Polychlorinated biphenyls
PAHs = Polycyclic aromatic hydrocarbons
OCPs = Organochlorine pesticides

FIGURE

Figure 1



Reference:

1. U.S.G.S. Topographic Map, Torrance, California 7.5 Minute Quadrangle. Georeferenced using the State of California's CASIL On-line GIS Database, Copyright 2006.

Source: Soil Investigation Report, Historic Stormwater Pathway, Earth Tech, Inc. 2008

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Sharp Environmental Technologies, Inc. 839 S. Beacon Street, #1967, San Pedro, California 90733 Tel (310) 505-3675 Fax (310) 548-3935	**Historical Stormwater Pathway - South Montrose Chemical Superfund Site** U.S. EPA Region 9 Los Angeles County, California	**FIGURE 1** Site Location

APPENDIX A

Laboratory Quality Assurance Manuals

QUALITY ASSURANCE MANUAL

Revision 10/2005

Effective October 2005

Quality Assurance Guidelines Applicable
to all Chemical Testing

ASSOCIATED LABORATORIES
806 N. BATAVIA
ORANGE, CA 92868
714-771-6900

SIGNATURES AND APPROVALS:

PRESIDENT:

Tito Parola — Date: 10/28/05

VICE PRESIDENT:

Robert Webber — Date: 10/31/05

VICE PRESIDENT, TECHNICAL DIRECTOR:

Edward S. Behare, PhD — Date: 10/25/05

DIRECTOR OF QUALITY ASSURANCE:

James McCall, PhD — Date: 10/28/05

TABLE OF CONTENTS

APPENDICES

MANAGEMENT QUALITY POLICY STATEMENT

It is the policy of Associated Laboratories to provide all clients with test results that are accurate and legally defensible. Associated Laboratories management is committed to good professional practices and quality in environmental testing and calibration as documented in the Quality Assurance Manual and all applicable NELAC standards.

This policy has the full support of Management and must be accomplished with the cooperation of all employees. All personnel concerned with environmental testing and calibration activities within the laboratory are required to familiarize themselves with the quality documentation and implement the policies and procedures in their work.

ORGANIZATION AND MANAGEMENT STRUCTURE

Associated Laboratories is a privately owned, independent laboratory incorporated in California (DePar, Inc.). The laboratory is actively managed by three directors. The laboratory is organized into Departments as follows:

1. Sample Receiving
2. Sample Custodian and Sample Storage
3. General Chemistry
4. Metals (ICP/AA)
5. Pesticides Analysis
6. Hydrocarbons Analysis
7. Volatile Organic Compounds GCMS
8. Semi-Volatile Organic Compounds GCMS
9. Microbiology
10. Fish Bioassay
11. TOC / Radioactivity
12. Sampling and Sample Pickup
13. QA Department

Each Department is managed by a Department Supervisor who reports to the Laboratory Directors.

The Quality Assurance Department operates independently from the other Departments. The Quality Assurance Director reports directly to the Laboratory Directors.

An Organization Chart is attached in Appendix G.

The Directors manage all operations of the laboratory and are the official signatories for all Laboratory Analysis Reports and other official documents of the Laboratory. The QA Director is the official signatory for Quality Assurance documents and may also sign Laboratory Analysis Reports. The signature page of this document includes all approved laboratory signatories.

All personnel are employees of the laboratory. Where contracted and additional technical and key support personnel are used, the laboratory ensures that such personnel are supervised and competent and that they work in accordance with the laboratory' s quality system.

RELATIONSHIP BETWEEN MANAGEMENT, TECHNICAL OPERATIONS, SUPPORT SYSTEMS AND THE QUALITY SYSTEM

The Laboratory Directors manage all operations of the laboratory and all technical operations support systems. The Quality System operates independently of other laboratory operations and reports directly to the Laboratory Directors.

JOB DESCRIPTIONS OF KEY STAFF

The job descriptions of key staff are attached in Appendix A.

FACILITIES, MAJOR EQUIPMENT AND SERVICES

ASSOCIATED LABORATORIES is located in two buildings:

Main Office and Laboratory: 806 North Batavia Street, Orange, CA 92868

Annex: 1108 West Barkley, Orange, CA.

Telephone: 714-771-6900
Fax No: 714-538-1209

Associated Laboratories has been in operation for over 80 years and is currently employing 75+ personnel.

Our main facility occupies 10,000 square feet, 8,000 square feet is laboratory space and 2,000 square feet office space. The Annex occupies 7,500 square feet and is maintained free of organic solvent vapors for analysis of volatile organic compounds. The annex also contains the microbiology and metals laboratories.

Refrigeration and freezers are provided for sample storage according to the method requirements. Samples are always stored in refrigerators and freezers separate from analytical standards to avoid cross contamination.

The laboratory monitors, controls and records environmental conditions as required by the relevant specifications, methods and procedures or where they influence the quality of the results. If specific environmental conditions are specified in a test method or by a regulation then the environmental conditions are documented on the sample preparation documents or separate monitoring document. Special procedures are prepared when necessary to meet environmental conditions.

The latest equipment inventory is attached (Appendix D)

ACCREDITATIONS

Associated Laboratories is accreditated by the following agencies:

- State of California, Department of Health Services, Environmental Laboratory Accreditation Program, Berkeley, Certificate No. 1338 .
- State of Hawaii, Department of Health, Safe Drinking Water Branch.
- State of Nevada, Department of Human Resources, Health Division, Bureau of Licensure and Certification.
- U.S. Army Corps of Engineers, Dept. of the Army, Omaha, NE.
- U.S. Food and Drug Administration, Department of Health and Human Services.

A listing of all test methods accredited by California is attached in Appendix K.

PERSONNEL QUALIFICATIONS

The laboratory management shall ensure the competence of all who operate specific equipment, perform environmental tests and/or calibrations, evaluate results, and sign test reports and calibration certificates. The laboratory management shall be responsible for checking the qualification of person before hiring based on the minimal level of qualification, experience and skills necessary for all positions in the laboratory (see Appendix A, Laboratory Job Descriptions). In addition to education and/or experience, basic laboratory skills such as using a balance, colony counting, aseptic or quantitative techniques shall be considered. Any falsification or inaccuracy of the employment application or educational diploma will be cause for the termination of employment. A copy of educational diplomas or certificates will be required to be included in the personnel file of new employees.

Records of personnel qualifications, training and experience are maintained in the employee training files maintained by the QA Department. The Laboratory training program is detailed below.

PERSONNEL TRAINING PROGRAM

All personnel shall be responsible for complying with all quality assurance/quality control requirements that pertain to their organizational/technical function. Each technical staff member must have a combination of experience and education to adequately demonstrate a specific knowledge of their particular function and a general knowledge of laboratory operations, test methods, quality assurance/quality control procedures and records management.

All current as well as new technical personnel are required to become familiar with the the following documents:

Laboratory Safety Manual - A formalized laboratory safety training course has been established, including a video discussion of safety and a written test. An attendance log and the test results are filed in the Employee Safety Documentation File. Each employee is also given a copy of the Laboratory Safety Manual.

Quality Assurance Manual - A copy of the Quality Assurance Manual is available in all departments. All employees are required to understand and follow the appropriate Quality Assurance guidelines and procedures.

Standard Operating Procedures - Standard Operating Procedures (SOP's) are available to all analysts for most analytical methods. For analytical methods, the SOP provides details regarding specific procedures and QA acceptance limits. SOP's are also available for most laboratory operations. Analysts are required to understand and follow the standard method requirements as detailed in the SOP for each analytical method. Each SOP is reviewed at least annually by the analysts and department manager to insure that the SOP accurately describes the analytical procedure. All SOP's are approved by the department manager and the QA Director.

The Department Supervisor is responsible for ensuring that all department personnel read and understand the Safety Manual, QA Manual, standard methods and appropriate SOP's. Completion of these requirements and all other specific training are documented in the employee training records. Training records are filed in the employee training file maintained for each technical employee. Successful completion of training courses and other formalized training are also filed in the employee training files.

In addition, the following training is conducted:

Technicians are also given on-the-job training for each new method or procedure by the supervisor or an experienced analyst designated by the supervisor. During the training period the supervisor or experienced analyst continues to be responsible for all analytical results produced by the trainee. This training is also documented on the employee's training record.

Competence to perform each analysis is determined by the supervisor's direct evaluation and successful analysis of Lab Control Samples and/or Performance Evaluation Samples.

Periodically, analysts are encouraged to attend outside classes or other relevant training to increase their job knowledge. Attendance at these courses/seminars are also recorded on the training record.

Training Files

Training files for each employee are maintained by the QA Department. The training files contain training logs, sign-off sheets for the QA Manual, Standard Operating Procedures and Initial and Continuing Demonstration of Capability Certificates and supporting documentation. The training files are updated on an annual basis. Annually each employee signs a form that demonstrates that they have read, understood, and is using the latest version of the laboratory's in -house quality documentation, which relates to his/ her job responsibilities.

Demonstration of Capability

For NELAP certified tests an Initial Demonstration of Capability (IDOC) must be performed prior to using any test method, and at any time there is a change in instrument type, personnel or test method (NELAC, Quality Systems Revision 16, Appendix C, July 12, 2002). The Demonstration of Capability is updated annually, and a signed certification is placed in the employee training file for each method. When a work cell is employed, the performance of the group is linked to the training record of the individual members of the work cell.

The analyst training on each method shall be considered up to date if the employee training file contains a certification that the analyst has read, understood and agreed to perform the most recent version of the test method (the approved method or standard operating procedure as defined by the laboratory document control system) and documentation of continued proficiency by at least one of the following once per year:

a. acceptable performance of a blind sample (single blind to the analyst);

b. another demonstration of capability;

c. successful analysis of a blind performance sample on a similar test method using the same technology (e.g., GC/MS volatiles by purge and trap for Methods 524.2, 624 or 5035/8260) would only require documentation for one of the test methods;

d. at least four consecutive laboratory control samples with acceptable levels of precision and accuracy; or

e. if a-d cannot be performed, analysis of authentic samples with results statistically indistinguishable from those obtained by another trained analyst.

f) A certification statement is completed to document the completion of each demonstration of capability. A copy of the certification statement is retained in the personnel records of each affected employee.

Ethics Policy and Data Integrity Training

To prevent Data Fraud/Inappropriate Practices, all technical personnel are trained in ethical and legal responsibilities. Examples of Data Fraud are identified below:

a) Inappropriate use of manual integrations to meet calibration or method QC criteria would be considered fraud. For example, peak shaving or peak enhancement are considered fraudulent activities if performed to meet QC requirements.

b) Time travel of analyses to meet method holding time requirements.

c) Falsification of results to meet method QA requirements.

d) Reporting of results without analyses to support the results.

e) Selective exclusion of data to meet QC criteria (i.e. initial calibration points dropped without technical or statistical justification)

f) Misrepresentation of laboratory performance by presenting calibration data or QC data within data reports which are not linked to the data set reported.

g) Notation of matrix interference as basis for exceeding acceptance limits (typically without implementing corrective actions) in interference-free matrices (e.g. MB or LCS)

The potential punishments and penalties for improper, unethical or illegal actions include immediate dismissal, and possible legal court action.

All technical personnel are required to sign an Ethics and Data Integrity Agreement Form. These forms are filed in the QA Office.

The Ethics and Data Integrity Training and Agreement Form is updated annually for each employee.

Internal audits are performed periodically which include monitoring of data integrity. Any allegations of improper reporting or manipulation of data are investigated promptly.

DOCUMENT CONTROL AND RECORD KEEPING

All documents relating to laboratory analyses and reporting are kept a minimum of seven years. After that time the records will be destroyed, unless special arrangements are made.

The laboratory maintains a tracking system for Standard Operating Procedures, MDL determinations, training documentation and corrective actions. These records are kept by the QA Department.

A Lab Request is created by the Laboratory LIMS system for each group of samples received from a client to enable organization and tracking of the analyses and final reporting. All analytical results are reported in the LIMS database system, including date of analysis and analyst initials. All documentation other than bound laboratory notebooks relating to the analyses of a client's samples including a copy of the final report, Chain of Custody, all sample preparation worksheets and analytical raw data is attached to each Lab Request. Lab Requests including all relevant data are filed for a minimum of seven years. Other relevant analysis data may be written in bound laboratory notebooks which are maintained in each laboratory department. All calibration data and other relevant data such as calibration checks, which may apply to multiple Lab Requests are filed and retained in the individual departments.

Corrections

All generated data is recorded in permanent ink. Entries in records shall not be obliterated by methods such as erasures, overwritten files or markings. All corrections to record-keeping errors shall be made by one line marked through the error. The individual making the correction shall sign (or initial) and date the correction.

The document control system establishes procedures to ensure that all records required under the laboratory certification are retained. Procedures for control and maintenance of documentation through a document control system ensures that all standard operating procedures (SOPs), manuals, or documents clearly indicate the time period during which the procedure or document was in force.
Document control procedures are defined in the Standard Operating Procedure for Document Control.

REVIEW OF CLIENT PROJECTS

New projects and contracts are reviewed by laboratory management to ensure that the laboratory has the technical capability and resources to meet the requirements. Any potential conflict of interest or other problem noted in the review is discussed with the client prior to acceptance of the contract or samples. Refer to the SOP for Project Management.

The laboratory will afford clients or their representative 's cooperation to clarify the client' s requests and monitor the laboratory 's performance in relation to the work performed.

Client confidentiality is a high priority and the laboratory will ensure confidentiality to each client's work while providing service to other clients.

PROTECTION OF CLIENT CONFIDENTIALITY

Associated Laboratories recognizes the importance of client confidentiality. Each Lab Report contains the following statement: "The reports of Associated Laboratories are the confidential property of our clients and may not be reproduced or used for publication in part or in full without our written permission. This is for the mutual protection of the public, our clients, and ourselves." Analysis results are released to third parties only with the permission of the client.

Confidentiality agreements may be signed by Laboratory management to maintain confidentiality of analysis results between the Laboratory and the client.

SAMPLE RECEIVING AND CUSTODY

All sample receiving and log-in is handled by the Sample Receiving Department.

1. All samples are assigned a laboratory identification number during the log-in process. This number is a unique identifier assigned by the laboratory LIMS system.

2. All samples received from a client on the same day on the same Chain of Custody (COC) are normally grouped together in a unique Laboratory Request Number. The Laboratory Request Number is also assigned by the laboratory LIMS system.

3. A Laboratory Request Summary is prepared which includes: date, client name, client sample ID, corresponding laboratory sample number, all analyses to be performed, laboratory area designations and other special instructions.

Procedures for sample receiving and chain of custody for samples are detailed in the Sample Receiving SOP, attached to this document as Appendix B.

SAMPLE HANDLING PRACTICES AND CHAIN OF CUSTODY

1. After samples are logged in, they are transferred to the Sample Custodian.

2. All transfer of samples out of and into storage are documented on the Sample Control Record Book.

3. *Samples are stored according to the conditions specified by preservation protocols. Samples which require thermal preservation are stored under refrigeration which is +/-2 of the specified preservation temperature unless method specific criteria exist. For samples with a specified storage temperature of 4°C, storage at a temperature above the freezing point of water to 6°C is considered acceptable.*

4. *Samples are stored away from all standards, reagents, food and other potentially contaminating sources. Samples are stored in such a manner to prevent cross contamination.*

5. *Sample fractions, extracts, leachates and other sample preparation products are stored according to #3 above or according to specifications in the test method.*

6. The temperature of each refrigerator used for sample storage is monitored each working day, and recorded on the Temperature Control Record. This record is attached to each refrigerator. When the record is completely filled in, it is filed for future reference. If the temperature is out of control limits, the laboratory manager must be notified immediately.

7. Unless notified in writing, all samples will be discarded by appropriate disposal protocol 30 days from the date reported. Samples are discarded in the designated hazardous waste disposal containers. These containers are picked up periodically by a hazardous waste disposal company.

SAMPLE CONTAINERS, PRESERVATION AND HOLDING TIMES

In general, the shorter the time that elapses between collection of a sample and the analysis, the more reliable will be the analytical results. Preservation is necessary when the interval between sample collection and analysis is long enough to produce changes in either the concentration or the physical state of the constituent to be measured. Preservation of samples is specified in many EPA methods and when possible is confirmed by the laboratory during the sample log in process. The holding time of an analysis is the maximum time that samples may be held before analysis for the analysis to be considered valid. Each department is familiar with the holding times for sample analysis which they perform. The supervisor is responsible for ensuring that these holding times are met for all analyses. If holding times are not able to be met, then every effort is made to notify the client and if necessary send the samples to another laboratory.

Appendix C contains sample container guidelines and holding times as specified by the USEPA for environmental samples.

LABORATORY LIMS SYSTEM

Laboratory Information Management System (LIMS)

The laboratory information management system (LIMS) is a client-server network of computers used to login samples, track samples during and after analysis, and report the final results to the client. In addition the LIMS software which is database driven is able to generate historical reports and trends and generate other types of reports such as electronic deliverables which are increasingly used by clients to transfer data into their own computer systems without having to do manual data entry. The LIMS system is also used to track laboratory data such as detection limits (MDL) and reporting limits for analytes.

The hardware components of the LIMS include two servers and approximately twenty-five PC compatible computers running Windows 98 - 2000. The LIMS Software consists of Varian Starlims 7.0 with an Oracle 7 database system.

Security consists of a password login system and nightly tape backups. All reports are reviewed and signed by designated managers before release to the client. Tracking reports are generated daily from the LIMS system to insure timely analysis and reporting of all client samples.

Electronic Delivery Capabilities - laboratory data can be delivered to the client in electronic data deliverable (EDD) formats such as: spreadsheet (Lotus, Excel); standard database file formats (dB, Paradox, etc); delimited or fixed field formatted ASCII; or word processing formatted. The data files can be transmitted to the client either by diskette or directly using e-mail or FTP protocols.

STANDARD TEST METHODS

Essentially all laboratory analyses are conducted using published standard methods. Standard method sources which are available for use are listed below.

Analytical Standard Procedures for Environmental Analyses:

Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79- 020,3/1983

Standard Methods for the Examination of Water and Wastewater (American Public Health Association)

40 CFR, Appendix A to part 136-Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater (600-series methods)

Methods for the Determination of Organic Compounds in Drinking Water, Supplement III, EPA-600/R-95/131, August 1995. (500-series methods)

Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993

Methods for the Determination of Metals in Environmental Samples, Supplement I EPA/600/R-94/111, May 1994

Test Methods for Evaluating Solid Waste, SW-846, 3rd Edition.

NELAC Quality Systems Revision 16, July 12, 2002.

Analytical Standard Procedures for Food, Feeds, Oil/Fats and Pharmaceuticals:

Association of Official Analytical Chemists (AOAC).

The American Oil Chemists' Society (AOCS).

Methods of the U.S. Department of Agriculture (USDA).

FDA Pesticide Analytical Manual (PAM).

US Pharmacopeia/National Formulary (USP/NF).

Food Chemicals Codex (FCC).

American Society for Testing and Materials (ASTM)

Note:

A listing of all environmental test methods for which Associated Laboratories is accredited by California is attached in Appendix H.

Methods Not Covered by Standard Methods

When it is necessary to use methods not covered by standard methods, these methods are subject to agreement with the client. This agreement includes a clear specification of the client' s requirements and the purpose of the environmental test and/ or calibration. The method is validated appropriately before use.

STANDARD OPERATING PROCEDURES

Standard Operating Procedures (SOP) are available for most methods to indicate specific procedures, instrumentation, data needs and laboratory data quality requirements. Standard Operating Procedures are available to the analyst and are updated at least annually to insure that method and quality assurance requirements are being met. The original version of the SOPs are filed in the QA Department and controlled copies made available to the department. An inventory list of all current SOP's is maintained by the QA Department and are listed in Appendix H.

Each test method shall include or reference where applicable:
1) identification of the test method;
2) applicable matrix or matrices;
3) detection limit;
4) scope and application, including components to be analyzed;
5) summary of the test method;
6) definitions;
7) interferences;
8) safety;
9) equipment and supplies;
10) reagents and standards;
11) sample collection, preservation, shipment and storage;
12) quality control;
13) calibration and standardization;
14) procedure;
15) calculations;
16) method performance;
17) pollution prevention;
18) data assessment and acceptance criteria for quality control measures;
19) corrective actions for out-of-control data;
20) contingencies for handling out-of-control or unacceptable data;
21) waste management;
22) references; and,
23) any tables, diagrams, flowcharts and validation data.

TRACEABILITY OF MEASUREMENTS

Traceability of measurements is achieved by using standards for calibration and calibration checks which are traceable to primary NIST standards. Certificates of Analysis or purity are kept on file for each standard purchased, showing the traceability of the standard to a primary NIST standard. All balances are calibrated and certified annually using NIST certified weights. Thermometers are also calibrated at least annually using a thermometer certified against an NIST temperature standard.

When standard solutions, spiking solutions and calibration check solutions are prepared, the following information is recorded in a Standards Traceability Notebook maintained by each Laboratory Department:

a. The identifying name of the Working Standard consists of the Working Standard Identification and the date of preparation. This name must be unique and apply to only one standard solution, such that the standard can be unequivocally traced back to the date of preparation, analyst and identification of all original standards and reagents used to prepare the standard.

b. Date and analyst initials

c. The name, manufacturer and lot number of each analytical standard, reagent and acid used in the solution.

d. The volume of each standard, reagent and acids used, and the final volume of the solution.

e. The calculated concentration of all analytes in the final solution.

The final standard solutions are transferred to a storage container and labeled with the identifying Working Standard ID, date of preparation, expiration date, concentration and initials of the analyst who prepared the solution.

All commercially prepared standards have a maximum expiration date of one year from the date of receipt or other expiration date as established and documented by the supplier.

Reagents are purchased from established commercial suppliers as specified by the laboratory standard methods or SOP. Reagents are stored at the appropriate temperature (refrigeration, freezing, room temp) as specified by the supplier.

Lot numbers of reagents are recorded on sample preparation log sheets or in analysis log books to enable traceability.

CALIBRATION AND VERIFICATION PROCEDURES

Initial Calibrations

Criteria for Initial Calibrations are specified in the applicable method and Standard Operating Procedure for each method.

The following items are essential elements of initial instrument calibration:

a) The details of the initial instrument calibration procedures including calculations, integrations, acceptance criteria and associated statistics are included or referenced in the test method SOP.

b) Sufficient raw data records are retained to permit reconstruction of the initial instrument calibration, e.g., calibration date, test method, instrument, analysis date, each analyte name, analyst's initials or signature; concentration and response, calibration curve or response factor; or unique equation or coefficient used to reduce instrument responses to concentration.

c) Sample results must be quantitated from the initial instrument calibration and may not be quantitated from any continuing instrument calibration verification unless otherwise required by regulation, method, or program.

d) All initial instrument calibrations must be verified with an **Initial Calibration Verification** standard (ICV) obtained from a second manufacturer or lot number. Standards for the initial calibration are traceable to a national standard such as NIST (National Institute of Standards and Technology), when available.

e) Criteria for the acceptance of an initial instrument calibration must be established, e.g., correlation coefficient or relative percent difference. The criteria used must be appropriate to the calibration technique employed.

f) Results of samples outside of the concentration range established by the initial calibration must be reported with defined qualifiers or flags or explained in the case narrative. The lowest calibration standard must be above the detection limit (MDL).

g) If the initial instrument calibration results are outside established acceptance criteria, corrective actions must be performed and all associated samples reanalyzed. If reanalysis of the samples is not possible, data associated with an unacceptable initial instrument calibration are reported with appropriate data qualifiers.

h) Calibration standards must include concentrations at or below the regulatory limit/decision level, if these limits/levels are known by the laboratory, unless these concentrations are below the laboratory's demonstrated detection limits.

i) The number of points for establishing the initial instrument calibration are determined by the method and regulatory guidelines and are stated in the SOP for each method.

Continuing Calibration Verification (CCV)

When an initial instrument calibration is not performed on the day of analysis, the validity of the initial calibration is verified prior to sample analyses by a continuing instrument calibration verification with each analytical batch. The following items are essential elements of continuing instrument calibration verification:

a) The details of the continuing instrument calibration procedure, calculations and associated statistics must be included or referenced in the test method SOP.

b) A continuing instrument calibration verification must be repeated at the beginning and end of each analytical batch. The concentrations of the calibration verification shall be varied within the established calibration range. If an internal standard is used, only one continuing instrument calibration verification must be analyzed per analytical batch.

c) Sufficient raw data records must be retained to permit reconstruction of the continuing instrument calibration verification, e.g., test method, instrument, analysis date, each analyte name, concentration and response, calibration curve or response factor, or unique equations or coefficients used to convert instrument responses into concentrations. Continuing calibration verification records must explicitly connect the continuing verification data to the initial instrument calibration.

d) Criteria for the acceptance of a continuing instrument calibration verification must be established, e.g., relative percent difference.

e) If the continuing instrument calibration verification results obtained are outside established acceptance criteria, corrective actions must be performed. If routine corrective action procedures fail to produce a second consecutive (immediate) calibration verification within acceptance criteria, then either the laboratory has to demonstrate performance after corrective action with two consecutive successful calibration verifications, or a new initial instrument calibration must be performed. If the laboratory has not demonstrated acceptable performance, sample analyses shall not occur until a new initial calibration curve is established and verified. However, sample data associated with an unacceptable calibration verification may be reported as qualified data under the following special conditions:

1) when the acceptance criteria for the continuing calibration verification are exceeded high, i.e., high bias, and there are associated samples that are non-detects, then those non-detects may be reported. Otherwise the samples affected by the unacceptable calibration verification shall be reanalyzed after a new calibration curve has been established, evaluated and accepted.

2) when the acceptance criteria for the continuing calibration verification are exceeded low, i.e., low bias, those sample results may be reported if they exceed a maximum regulatory limit/decision level. Otherwise the samples affected by the unacceptable verification shall be reanalyzed after a new calibration curve has been established, evaluated and accepted.

METHOD DETECTION LIMITS

Method Detection Limits (MDL) are normally determined by taking seven or more aliquots of a sample containing the compounds of interest at a concentration 1 to 5 times the estimated detection limit and processing each sample through the entire analytical method. The MDL is calculated from the standard deviation of the replicate measurements (MDL = 3.143 x Standard Deviation for seven replicate measurements). MDL studies for each method are normally performed at least annually or when a major modification is made to the method or instrumentation used for analysis. Reference: 40 CFR, Ch. 1, Part 136, Appendix B (7-1-86 Ed.).

Method Detection Limits are updated in the laboratory information management system (LIMS) and tracked by the QC Department. The SOP for determination of MDL is attached (Appendix E).

PROCEDURES FOR REPORTING ANALYTICAL RESULTS

Final Reports issued to clients contain at a minimum the following information:

1. The report identification (Lab Request number) and page number is printed at the bottom of each page.

2. The Cover Page(s) include the Laboratory name and address, phone number, name and signature of person authorizing the report. The Cover page(s) also include the Client name,

address, Client ID number, project identification, contact or project manager, date of sample receipt at the laboratory and a cross-reference of lab identification numbers and client sample identifications. The Cover Page includes the statement: *"The reports of the Associated Laboratories are confidential property of our clients and may not be reproduced or used for publication in part or in full without our written permission. This is for the mutual protection of the public, our clients, and ourselves."*

3. The Lab Report pages detail the date and time of sample collection, the test results, analysis units, methods of analysis, detection limits, dates of analyses and analyst initials. The time of analysis is reported when the holding time for preparation or analysis is 72 hours or less.

4. The original copy of the chain-of-custody is attached to the final report

5. A copy of the *Sample Receiving Checklist is attached to the final report.*

6. For NELAC reports and data packages, a case narrative is attached. The case narrative describes where the analyses were performed if not performed at the main address of the laboratory. Normally all analyses for volatile organic chemicals, organic volatiles in air, metals and microbiology are performed in the laboratory annex, located at 1108 West Barkley (one half block from the main laboratory building.

7. The case narrative also lists the number and identification of all discrete pages in the report and the total number of pages in the complete report.

8. A statement is included in the Narrative that the test results meet all requirements of NELAC or provide reasons and/or justification if they do not.

9. In addition to the requirements listed above, test reports shall, where necessary for the interpretation of the test results, include the following:

> *a) deviations from (such as failed quality control), additions to, or exclusions from the test method, and information on specific test conditions, such as environmental conditions and any non-standard conditions that may have affected the quality of results, including the use and definitions of data qualifiers;*
>
> *b) where relevant, a statement of compliance/non-compliance with requirements and/or specifications, including identification of test results derived from any sample that did not meet NELAC sample acceptance requirements such as improper container, holding time, or temperature;*
>
> *c) where applicable, a statement on the estimated uncertainty of measurement; information on uncertainty is needed in test reports when it is relevant to the validity or application of the test results, when a client's instruction so requires, or when the uncertainty affects compliance to a specification limit;*
>
> *d) where appropriate and needed, opinions and interpretations;*
>
> *e) additional information which may be required by specific methods, clients or groups of clients;*

f) clear identification of numerical results with values outside of quantitation limits.

10. In addition to the requirements listed above, test reports containing the results of sampling shall include the following, where necessary for the interpretation of test results:

a) the date of sampling;

b) unambiguous identification of the substance, material or product sampled (including the name of the manufacturer, the model or type of designation and serial numbers as appropriate);

c) the location of sampling, including any diagrams, sketches or photographs;

d) a reference to the sampling plan and procedures used;

e) details of any environmental conditions during sampling that may affect the interpretation of the test results;

f) any standard or other specification for the sampling method or procedure, and deviations, additions to or exclusions from the specification concerned.

DATA REVIEW

All data generated from each analysis are recorded either in a bound laboratory notebook or on worksheets which are attached to the Lab Request package.

Copies of the lab notebook page(s), worksheets, instrument readouts, chromatograms, QC forms and other data pertinent to the analysis are attached to the Laboratory Request Sheet.

In addition to the analytical results and calculations, the manufacturer and lot number of all reagents used must be included. Also the assigned code numbers of all prepared reagent and standard solutions are included for traceability purposes.

The review process includes at least three separate review stages:

The analyst reviews all data and calculations and also checks data for completeness and that any special requirements have been met.

The Lab Supervisor reviews the results and initials the report to signify his/her approval.

After the final report is completed, the Laboratory Manager or signatory of the report reviews the final report and signs the report to signify his/her final approval.

The QA Department reviews a proportionate amount of all QC data generated (at least ten percent) and also reviews all corrective action reports that are submitted by the Departments.

A copy of the test report and all supporting raw data for each Lab Request are maintained on file by the laboratory.

The minimum period of retention for the records is seven (7) years.

PROCEDURE FOR HANDLING CUSTOMER'S COMPLAINTS

Associated Laboratories encourages feedback from customers. Complaints such as improper billing or incorrect sample identifications are normally handled by client project managers, who make every effort to resolve the problem as quickly as possible. Where the complaint involves problems which can not be readily corrected, then the customer's complaints are recorded on a Customer Complaint Form which contains the following information:

Date of complaint
Name of company
Name of person submitting the complaint
How the complaint was submitted
Name of person receiving complaint by phone
Nature of complaint
Department(s) involved

The customer's complaint form is submitted to the department(s) involved for investigation and resolution of the complaint.

The results of the investigation and resolution of the complaint are recorded on the complaint form, signed and dated by the individual handling the complaint and submitted to the Lab Manager to be reviewed and approved.

The customer is notified of the results of the investigation and resolution of the complaint by the Lab Manager or by a person authorized by the Lab Manager, either verbally, by phone, or in the form of a letter.

The Complaint Form and all other documents pertinent to the complaint are filed in the Complaint File maintained by the QA Department.

QUALITY ASSURANCE PROCEDURES

The laboratory has established quality control procedures for monitoring the validity of environmental tests and calibrations undertaken. The resulting data is recorded in such a way that trends are detectable and, where practicable, statistical techniques can be applied to the reviewing of the results. This monitoring includes the following:

a) regular use of certified reference materials and/or internal quality control using secondary reference materials (Laboratory Control Samples);

b) participation in interlaboratory comparison or proficiency-testing programs (WS, WP and Hazardous Waste PE samples);

c) replicate tests or calibrations using the same or different methods;

d) retesting of retained samples;

e) correlation of results for different characteristics of a sample (for example, total phosphate should be greater than or equal to orthophosphate).

Routine Quality Control Samples

Quality Control samples are normally analyzed with each batch of samples for each analysis. For environmental samples the Quality Control samples include a Method Blank (MB), Laboratory Control Sample (LCS) and a Matrix Spike and Matrix Spike Duplicate. These QC samples are included in each batch of twenty samples or less for each matrix (frequency equivalent to 5% of all samples analyzed). If spike analyses are not feasible, a duplicate sample analysis is generally performed (eg TDS, dissolved oxygen, turbidity).

1. The Method Blank (negative control sample) is used to assess the preparation batch for possible contamination during the preparation and processing steps. The method blank is processed along with and under the same conditions as the associated samples to include all steps of the analytical procedure. Procedures are included in the method to determine if a method blank is contaminated. Any affected samples associated with a contaminated method blank are reprocessed for analysis or the results reported with appropriate data qualifying codes.

2. The Laboratory Control Sample (LCS) (Positive Control Sample) is used to evaluate the performance of the total analytical system, including all preparation and analysis steps. Results of the LCS are compared to established criteria and, if found to be outside of these criteria, indicate that the analytical system is "out of control". Any affected samples associated with an out of control LCS are reprocessed for re-analysis or the results reported with appropriate data qualifying codes. The Laboratory Control Sample (LCS) is run at the same frequency as QC samples for each type of matrix. The LCS is obtained when possible from a source external to the laboratory. The LCS may be prepared by the laboratory using certified standards from a different source or a different lot number from the source used for calibration standards. For NELAP accredited tests, all analytes are included in the LCS spike mixture over a two year period.

3. A Matrix Spike and Matrix Spike Duplicate sample (replicate samples) are normally analyzed with each batch of twenty samples or less. Matrix spikes are duplicate aliquots of a sample which are spiked with the analytes of interest and taken through the same analytical procedures. The recovery of the analyte concentration is calculated to indicate the accuracy of the analysis in the sample matrix. The relative percent difference between the Matrix Spike and Matrix Spike Duplicate sample provides a measure of precision of the analyses in the sample matrix. For NELAP accredited tests, all analytes are included in the matrix spike mixture over a two year period.

4. Surrogate spike analyses are performed for all organic analyses when required by the method. Surrogates are used most often in organic chromatography test methods and are chosen to reflect the chemistries of the targeted components of the method. Added prior to sample preparation/extraction, they provide a measure of recovery for every sample matrix. The surrogate spike solution is added to all samples, standards and blanks. The results are compared to the acceptance criteria as published in the mandated test method or laboratory generated acceptance criteria. Results reported from analyses with surrogate recoveries outside the acceptance criteria *must* include appropriate data qualifiers.

5. All other QC requirements (tuning, multiple points calibration, daily calibration check, etc.) are performed as specified in the method.

6. All QC data are to be recorded on the appropriate forms and kept on file by each department. Copies of these forms must be attached to the Lab Requests for all samples associated with that particular QC sample. Accuracy and precision data may be used to generate control charts.

7. Acceptance limits for QC samples are detailed in the Standard Operating Procedure for each method, and may be established by the original reference source or statistical analysis of the historical data for each type of QC sample, method and matrix using control charts.

8. When QC acceptance criteria are exceeded, corrective actions are to be taken as specified in the method or as instructed by the Department Supervisor.

9. Non-conformances such as QA limit failures which cannot be corrected by re-analyses, client requirements which cannot be met or standard method modifications are documentated by initiating a Non-Conformance Document Form (NCD). Appendix F describes the use of the Non-Conformance Document Form.

Other Essential Quality Control Procedures

1. Method capabilities are measured by determination of detection limits and quantitation limits. This is done on an annual basis or more often as needed (page 18).

2. Selection of appropriate formulae to reduce raw data to final results such as regression analysis, comparison to internal/external standard calculations, and statistical analyses is detailed in the method Standard Operating Procedures for each method.

3. Selection and use of reagents and standards of appropriate quality is included in the method Standard Operating Procedures.

4. Measures to assure the selectivity of the test for its intended purpose is assessed on a continuing basis by analysis of QA samples as detailed above.

5. Measures are taken as necessary to assure constant and consistent test conditions (both instrumental and environmental) where required by the test method such as temperature, humidity, light, or specific instrument conditions.

6. All quality control measures are assessed and evaluated on an on-going basis, and quality control acceptance criteria are used to determine the usability of the data.

7. The laboratory will develop acceptance/rejection criteria where no method or regulatory criteria exist.

8. The quality control protocols specified by the laboratory's Standard Operating Procedure for each method is to be followed. The laboratory shall ensure that the essential standards outlined in NELAC, Quality Systems, Appendix D or the mandated methods or regulations (whichever are more stringent) are incorporated into their Standard Operating Procedures. When it is not apparent which is more stringent the QC in the mandated method or regulations is to be followed.

QUALITY ASSURANCE DEPARTMENT FUNCTIONS

Internal Audits and Data Review

Various types of internal audits are performed on Laboratory activities on a routine basis. These audits should reflect as closely as possible, the Laboratory performance under normal operating conditions.

Performance Audits: Evaluation of data reports generated by the laboratory. All technical, clerical and administrative aspects of the data report are reviewed. Errors observed during these ongoing audits are categorized as they relate to the technical accuracy and legal defensibility of data.

Internal audits of each department are conducted at least annually. Routine quality control checks, for example checking laboratory notebooks, daily calibrations, quality control sample frequency are also done on a random basis. Results of internal audits *(including the completed checklist, deficiencies, responses and corrective actions)* are documented in the internal audits files *maintained in the QA Office. The results of internal audits are* reported to the Audit Committee designated by the Laboratory management.

A system audit is the physical inspection and review of the entire laboratory operation to verify compliance with the QA Program objectives as stated in the Laboratory's QA Manual. System audits are conducted periodically by external auditors, such as state regulatory agencies, commercial clients or independent auditors representing these clients or agencies.

In response to deficiencies or recommendations from auditing activities, corrective actions reports are required to document the corrective actions taken to correct the deficiencies. The Laboratory management has established an *internal* audit committee to oversee audit activities and establish corrective actions where necessary. *The internal audit committee members will meet quarterly.All committee meeting minutes and memos will be maintained in the QA Office.*

Internal audit procedures are detailed in the SOP for Internal Audits.

When audit findings cast doubt on the effectiveness of the operations or on the correctness or validity of the laboratory' s environmental test or calibration results, the laboratory will notify clients in writing if investigations show that the laboratory results may have been affected.

The laboratory will notify clients promptly, in writing, of any event such as the identification of defective measuring or test equipment that casts doubt on the validity of results given in any calibration certificate, test report or test certificate or amendment to a report or certificate.

External Proficiency Testing and Verification Practices

The QA Department is responsible for organizing Proficiency Testing (PT) Programs, including WS and WP Studies, and other studies as required by accrediting agencies.

Proficiency Testing samples are obtained from NELAP approved external sources on a semi-annual basis. Results must be satisfactory (within acceptance limits) or a corrective action report is initiated. Proficiency Testing samples are analyzed semiannually or more often for all NELAP accredited tests. PT samples for ELAP accredited tests may be analyzed annually or semiannually. To demonstrate proficiency under NELAP guidelines, the laboratory must pass two of the three most recent PT samples for each accredited test.

Corrective Action Reports and Departures from Documented Policies

A Non-Conformance Document (NCD) may be required when certain Quality Control criteria are exceeded in a sample analysis batch.

1. Non-conformances such as a sample exceeding holding time, QA limit failures which can not be corrected by re-analyses, client requirements which cannot be met, or standard method modifications are documented by initiating a Non-Conformance Document Form (NCD). A copy of the NCD Standard Operating Procedure and Form is attached (Appendix F).

2. The NCD form is initiated by the analyst in the event of a sample exceeding holding time, Quality Control sample results outside control limits or other known non-conformance to the analytical method or client requirements. The NCD form may also be initiated by the project manager or department manager in the event client requirements are not met or other analytical problems are discovered.

3. After the NCD Form is initiated, the corrective action, if any, must be agreed upon by the department manager or supervisor and the QA Manager. If appropriate, the procedure for corrective actions starts with an investigation of the root cause(s) of the problem. This is documented and signed by the department manager in the second part of the NCD Form. The form is then forwarded to the QA Manager.

4. The QA Manager then completes and signs the final part of the form. If necessary, verification of the corrective action is documented in this section. If necessary the results will be monitored to ensure that the corrective actions taken have been effective.

5. A copy of the form is included in the affected data package or the client is notified as appropriate. The original is filed in the Corrective Actions File which is maintained by the QA Manager.

When there are deviations from the requirements by the specific method, such as insufficient sample volume, improper preservation, the client *will* be notified as soon as possible. If the client agrees to the deviation, then an explanation of the deviation or non-compliance is required to be attached to the data package and final report.

Laboratory Standard Operating Procedures and QA Manual

The QA Department is responsible for ensuring that all Laboratory Standard Operating Procedures and the QA Manual are current. A tracking system is in place to ensure that copies of Standard Operating Procedures are controlled such that only current approved versions are in use in the laboratory.

Procedures for tracking SOP documents are detailed in the Standard Operating Procedure for SOPs.

MANAGEMENT REVIEWS

In accordance with a predetermined schedule and procedure, the laboratory's executive management will periodically and at least annually conduct a review of the laboratory's quality system and environmental testing and/or calibration activities to ensure their continuing suitability and effectiveness, and to introduce necessary changes or improvements. The review shall take account of:

a) The suitability of policies and procedures;
b) Reports from managerial and supervisory personnel;
c) The outcome of recent internal audits;
d) Corrective and preventive actions;
e) Assessments by external bodies;
f) The results of inter-laboratory comparisons or proficiency tests;
g) Changes in the volume and type of the work;
h) client feedback;
i) complaints;
j) other relevant factors, such as quality control activities, resources and staff training.

Findings from management reviews and the actions that arise from them shall be recorded. The management shall ensure that those actions are carried out within an appropriate and agreed timescale. The laboratory shall have a procedure for review by management and maintain records of review findings and actions.

PERMITTED DEPARTURES FROM DOCUMENTED POLICIES AND PROCEDURES

Any departures from documented policies and procedures or changes in standard methods must be approved by a Laboratory Director or the QA Director. The deviation from standard methodology must be explained on the final report and the results flagged to indicate the use of a non-standard method. The * flag or qualifier is used to note non-standard methodology and the explanation is noted in the comments section of the Lab Report.

PREVENTIVE ACTIONS

Preventive action is a process to identify opportunities for improvement rather than a reaction to the identification of problems or complaints. Needed improvements and potential sources of nonconformance, either technical or concerning the quality system, are identified. If preventive action is required, action plans are developed, implemented and monitored to reduce the likelihood of the occurrence of such non- conformances and to take advantage of the opportunities for improvement. Procedures for preventive actions include the initiation of such actions and application of controls to ensure that they are effective.

EQUIPMENT MAINTENANCE

Written records are kept for each analytical instrument to document inspections, maintenance, troubleshooting, or modifications. Records contain the date, nature of the problem, repair/corrective action taken and the name of the person performing the work. A Maintenance Log Book may be kept for each individual instrument for the purpose of recording any maintenance, repairs, and other associated downtime.

Operational performance of analytical instrumentation is monitored by daily, documented performance checks and calibration verifications in accordance with the Standard Operating Procedures for each type of instrumentation.

Support equipment such as analytical balances, ovens, refrigerators and water baths are checked daily for performance within acceptance limits. This information is recorded in a log book maintained for the equipment. Weights used to check the balances are traceable to NIST standards. In addition all balances are inspected and certified by a licensed specialist at least annually.

REFERENCES:

NELAC Quality Systems, Revision 16, July 12,2002.

NELAC Quality Systems Checklist, Revision Ch5 Rev1e.

QUALITY ASSURANCE MANUAL REVISION HISTORY

Revision 09/2004: QA Manual all sections re-written to incorporate NELAC guidelines.
Added sections for:
- Demonstration of Capability
- Review of New Projects
- Protection of Client Confidentiality
- Calibration and Verification Procedures

Updated Appendix A, Laboratory Job Descriptions
Updated Appendix B, Standard Operation Procedures for Sample Receiving
Updated Appendix D, Equipment Inventory

Revision 05/2005: QA Manual re-written to incorporate more NELAC requirements.
Added Appendix G, Organization Chart
Added Appendix H, Listing of CA Accredited Methods
Added references to SOPs for Document Control

Revision 10/2005: Sections added in response to NELAC Audit.
Added section for personnel qualifications, pg. 8.
Added training program requirements, pg. 8.
Rewrote Demonstration of Capability, pg.10.
Rewrote procedures for reporting analytical results, pgs. 19-21.
Added section for ensuring the validity of environmental tests, pg.22.
Added section for essential Quality Control Procedures, pg. 24.
Edited section for Internal Audits, pg. 25.
Added section for management review, pg. 27.
Rewrote sample handling practices and chain of custody, pg. 13.

APPENDIX A

LABORATORY JOB DESCRIPTIONS

Technical Director (Lab Director)

Education: Bachelors degree or equivalent in the chemical, environmental, biological sciences, physical sciences or engineering, with at least 24 college semester credit hours in chemistry.

Experience: At least two years of experience in the environmental analysis of representative inorganic and organic analytes for which the laboratory seeks or maintains accreditation. A masters or doctoral degree in one of the above disciplines may be substituted for one year of experience

Job Description: The technical director(s) means a full-time member of the staff of an environmental laboratory who exercises actual day-to-day supervision of laboratory operations for the appropriate fields of accreditation and reporting of results. This person's duties shall include, but not be limited to, monitoring standards of performance in quality control and quality assurance; monitoring the validity of the analyses performed and data generated in the laboratory to assure reliable data.

Responsibilities: Overall responsibility for management of all laboratory operations.

Quality Assurance Manager

Education: Bachelor's degree in chemistry or other scientific/engineering discipline or equivalent experience.

Experience: Three or more years experience in a chemistry laboratory.

Job description: The quality manager (and/or his/her designees) shall:

1. Serve as the focal point for QA/QC and be responsible for the oversight and/or review of quality control data;

2. Have functions independent from laboratory operations for which they have quality assurance oversight;

3. Be able to evaluate data objectively and perform assessments without outside (e.g., managerial) influence;

4. Have documented training and/or experience in QA/QC procedures and be knowledgeable in the quality system as defined under NELAC;

5. Have a general knowledge of the analytical test methods for which data review is performed;

6. Arrange for or conduct internal audits as per 5.4.13 annually; and,

7. Notify laboratory management of deficiencies in the quality system and monitor corrective action.

Responsibilities: Overall development and management of the laboratory quality assurance system as defined by California Dept of Health / ELAP and NELAP requirements.

Laboratory Supervisor

Education: Bachelor's degree in chemistry or other scientific/engineering discipline or equivalent experience.

Experience: Three or more years experience in a chemistry laboratory.

Job Description: Responsible for the overall technical and personnel management of a laboratory area or work group. This includes:

1. Interfacing with and taking direction from the Department Head or immediate supervisor.

2. Proper training of personnel in analytical techniques, reporting, quality, assurance and lab safety.

3. Maintaining the orderly flow of work and the timely analyses of samples.

4. Organizing and assigning work duties of the group supervised.

5. Checking QA/QC records for completeness and proper frequency.

6. Providing for technical expertise as required in the group or department.

7. Evaluating and working to constantly improve the quality of data that is being generated (including QA data)

Responsibility, Supervisors are ultimately responsible for:

1. The accuracy, completeness and integrity of all analyses completed by their group or department.

2. Safe practices of their employees.

3. Maintaining effective communication with their employees and upper management of the laboratory.

4. Complete documentation of all analyses and related QA/QC.

5. Any deviation from standard methods or laboratory standard operating procedures.

Analyst

Education: Requires minimum of Bachelor's degree in chemistry or any scientific/engineering discipline or equivalent experience.

Experience: Once or more years experience in a chemistry laboratory operating and maintaining analytical instrumentation such as AA, ICP, GC, HPLC, etc.

Job Description: Conducts analyses in laboratory using specialized analytical equipment. Analyses are done using standard protocols such as EPA, EPA/CLP, or in-house SOP's). Must understand the theory, use and maintenance of specialized analytical equipment. Must be able to follow written procedures and SOP's and calculate final results, including QA results. Must understand the importance of good lab practices and quality assurance and be able to evaluate the quality of data that is being generated.

Responsibility: Analysts are responsible for the accuracy, completeness and integrity of all work that they have been assigned. If they have questions or problems, this must be communicated to their immediate supervisor. No deviations from standard methods are permitted unless approved by the lab supervisor.

Lab Technician

Education: Requires high school diploma with one year of chemistry course work or one year of Chemistry course work or one year experience in a laboratory.

Experience: One or more years experience in a laboratory (preferably a chemistry lab). Must have proficiency in operation of analytical balance, pipetting and common laboratory equipment and glassware.

Job Description: Conducts analyses in laboratory using standard methods (EPA, AOAC, USP, ASTM, or in-house methods). Must understand lab nomenclature and be proficient in the use of standard lab equipment such as pipets , balances, separatory funnels burets, etc. Must be able to follow written procedures and SOP's and calculate final results. Must understand the importance of good lab practices and quality assurance.

Responsibility: Lab Technicians are responsible for the accuracy, completeness and integrity of all work that they have been assigned. If they have questions or problems, this must be communicated to their immediate supervisor. No deviations from standard methods are permitted unless approved by the lab supervisor.

APPENDIX B

STANDARD OPERATING PROCEDURE FOR SAMPLE RECEIVING

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I. INITIAL RECEIPT OF SAMPLES

This section describes how samples are received and logged into the laboratory. "Logging" refers to the process of documenting receipt of each sample, verification of the analyses requested and entry of information about the sample into the laboratory computer system (LIMS). The sample logging process generates one label for each sample container, a Lab Request Summary on blue paper and a blue Results Worksheet for each department. A copy of the Lab Request Summary and the blue Results Worksheet is transferred to each department which will be analyzing the sample. No sample is analyzed without being properly logged into the laboratory data system, even if the sample is not to be billed.

A. Handling of Samples Received by Client Delivery:

When a client delivers a sample for analysis, it is important that information about the sample be as complete as possible. This is best done with a properly completed and signed Chain of Custody form. The following information must be obtained before the sample can be accepted:

1. Client's name and address

2. Person to contact regarding the sample(s) and phone number (also fax number if information is to be faxed).

3. Method of payment, does client have an account? If client does not have an account, payment will have to be in advance or "pickup and pay". If the client has an account, a purchase order number is often needed.

4. If the Client wishes to open an account, the accounting department should be notified to be sure the client receives the proper forms and information, this is currently handled by Bill Utter.

5. Before entering a new client into the computer system a unique account code number must be obtained from the accounting department or office supervisor.

6. Both the client and lab employee receiving the sample must both sign the completed Chain of Custody form. The Chain of Custody will normally contain detailed information on the samples. Refer to Section II for a list of required information to be included on this form.

7. The client receives the pink copy of the Chain of Custody. The other copies are attached to the Lab Request Summary.

8. Samples must be checked for temperature and sample preservation as noted in B.2. and B.6 below.

B. Sample pick-up by our personnel:

1. All samples received from our drivers should be accompanied by a completed Chain-of-Custody form - signed by the client and by the driver.

2. All coolers received must have a temperature reading immediately upon opening.

   a. This reading will be taken by placing the metal probe of the thermometer either into a temperature blank (if provided) or between the respective samples and the cooling media (ice, dry ice, or blue ice).

   b. The thermometer should remain in place for 60 seconds to ensure a proper reading.

   c. The exact temperature will then be read from the thermometer. The temperature should be in the range of 2 - 6 degrees C. Samples that are hand delivered to the laboratory immediately after collection are considered acceptable if there is evidence that the chilling process has begun, such as arrival on ice.

   d. The temperature will be noted on the Sample Receipt Form.

3. The Chain of Custody and samples must be checked to make sure that all information is in agreement.

4. When the driver relinquishes the samples to the Sample Receiving Department, he or she must require that the Associated Laboratories Chain of custody be signed by an employee of the Sample Receiving Department. A sample receipt form must be filled out for all coolers received by the Department.

5. All samples brought to the laboratory by a driver will remain under his or her custody until the Associated Laboratories Chain of custody is signed by an employee of the Sample Receiving Department.

6. The pH of all chemically preserved aqueous samples, except volatile samples, must be checked and documented upon receipt at the laboratory. If discrepancies are noted, the laboratory must contact the project manager or client immediately. The pH is measured and reported on a pH reporting form. This form is attached to the Chain of Custody. The procedure for checking pH is detailed in the SOP for pH Measurement.

7. Any problems with improper preservation, sample container type, volumes, etc. are to be noted on the Sample Receipt Form. This is to document problems which may interfere with a proper analysis of the sample. The project manager should be notified so that the client can be contacted as soon as possible.

8. Information on the sample pickup is also logged into the bound Driver's Logbook.

9. All organic volatile samples (VOA) must be stored in the Sample Receiving refrigerator until they are labeled.

10. All information is checked to be sure it is complete as noted in Section A.1-6 (Client's name/ address/ contact name/ phone number/ account information/ PO number/ complete sample information/ analyses requested).

11. All samples are checked to be sure they match the paperwork.

12. The client must be contacted if the information is not complete or if there are any questions about the samples, analyses requested, or if samples are received broken or missing.

C. Samples received by mail, UPS, Federal Express, etc.

Samples received by mail, UPS and Federal Express are handled in the same manner as samples received from our drivers with the exception that samples are not relinquished by the client. All coolers received must have a temperature reading as in section B.2. and all samples must be verified against the Chain of Custody or paperwork as noted above.

D. In-house samples

In-house samples consist of samples such as QA/QC check samples and hazardous waste disposal samples. These samples are written up using the same procedures as any other sample. (They will not normally be billed.)

E. Priority samples

1. Samples are logged in the following priority:

    a. Bacteriology

    b. Rushes (Same Day, 24 Hour, 48 Hour)

    c. Tests such as BOD, Chlorine, pH, Dissolved Oxygen, Sulfite, Sulfide, Hexavalent Chromium, fish toxicity, nitrate, nitrite, MBAS, turbidity must be logged the same day as received due to the very short holding times.

    d. Regular Turn-Around

2. NOTE: It is important that this priority be followed for all customers to insure that accurate results are obtained for samples which have a very short holding time.

3. Regular turn-around samples are written up in the order received and may be held to the next day if necessary.

4. When a client requests a completion date, or we commit to a completion date, this information must be clearly stated (and highlighted) on the lab request summary.

Note: the affected lab manager must be consulted prior to committing to a completion date.

5. If a client wishes samples to be handled on a priority basis, such as 24 or 48 hours, there is an additional charge. The priority charge is determined by lab management, and should be clearly stated to the client.

6. Priority samples are written up and labeled before being transferred to the laboratory. These

samples are recorded in the Sample Rush Log Book and the lab personnel receiving the samples must sign for all priority samples (which include a copy of the chain of custody).

F. Special Handling of Samples for Microbiological Testing

1. Due to the short holding times for microbiological samples, these must be handled on a first- priority basis.

2. The Chain-of-Custody for samples for microbiological testing must state the date and time of sampling, as well as complete sample identification. For potable water samples this should also include the system name and sample location.

3. Drinking water samples (potable water) should be analyzed as soon as possible after sampling (30 hours maximum time from sampling to analysis). Samples must be maintained at 2 - 6 degrees C during transport and storage. Potable water samples cannot be analyzed after 30 hours, these samples should be refused.

4. Waste water and surface water samples must be analyzed within 6 hours after collection (6 hours maximum holding time). Samples must be maintained at 2 - 6 degrees C during transport and storage. Water/ waste water samples older than six hours should be refused.

5. Upon receipt in Sample Receiving, check samples immediately for proper temperature and holding time. Samples should be transported in a cooler with blue ice or regular ice. Check Chain-of-Custody form to be sure samples are within holding times. If samples are outside holding time or not held at proper temperature, notify the Microbiology Department supervisor or project manager immediately. The Chain-of-Custody shall also state the conditions of the samples as received (cooled, frozen, room temp. etc.).

6. Check condition of samples received for microbiological testing for potential contamination of samples. Containers must be sealed with no evidence of leakage. Containers must be protected from melted ice or other potential contamination. Notify the Microbiology supervisor if problems are noted. If there is evidence of contamination the client should be notified that the samples are potentially contaminated.

7. Samples should be refrigerated or placed in a cooler with blue ice upon receipt and logged in immediately. The Microbiology Department will sign the original chain of custody to show receipt of samples prior to logging.

G. Sample storage during login process

1. When possible samples are written up as soon as received.

    3. A designated sample storage refrigerator is used for storage of samples which need to be refrigerated during the login process (samples for volatile organics analysis are stored in a separate refrigerator).

3. As soon as possible after each group of samples is logged in, they are transferred to the

Sample Custodian in the Sample Storage Area. Most samples are stored in refrigerators or the walk-in cooler until analyses are completed. The sample storage refrigerators and the walk-in cooler are kept locked overnight for sample security.

4. If special handling instructions are provided with the sample, these instructions must be noted on the Chain of Custody and sample login analysis request forms.

H. **Hold samples**

1. When a client wishes to put samples on hold, this must be clearly noted on a Chain-of-Custody form. The length of time requested for hold should be noted.

2. If the hold order is given over the phone, a note is made on the COC referring to the person authorizing the hold, with complete information on the samples to be held. The person taking the call should sign and date the note. Any changes to the Chain of Custody by the client should be followed by a fax from the client detailing the changes in writing.

3. Complete information on hold samples are filed with the Chain-of-Custody and given with the samples to the Sample Custodian for storage until the Client or project manager releases the samples from hold status. If hold samples are disposed of, they are logged out by the Sample Custodian.

4. After 7 days, if the client has not contacted us regarding the samples, sample receiving personnel or the project manager should call the client for instructions.

5. Maximum holding time is 30 days unless special arrangements are made and authorized by the lab management.

6. Unless authorized by the customer, disposal of hold samples must be authorized by the Lab Manager.

I. **Safety Precautions**:

1. The lab does not accept radioactive samples for analysis. A Radiation Monitor is available in the Sample Receiving Department for screening samples if radiation is suspected in any sample.

   a. Any samples received from Department of Energy (DOE) contracts or associated clients must be screened to insure that no radioactivity is present.

   b. If any sample tests higher than background 25 cpm level radiation, the Radiation Safety Officer must be notified immediately.

2. All sample shipments received from hazardous waste sites or labeled as highly toxic must be initially opened in a fume hood or in a well-ventilated area.

3. Plastic gloves are available in the Sample Receiving Area for handling potentially hazardous

samples or samples which are leaking.

4. When in doubt about the safe handling of any sample, the Lab Safety Officer or appropriate Lab Manager must be consulted before the sample is logged in.

II. CHAIN OF CUSTODY FORM

A. The purpose of the Chain of Custody Form is to legally document the transfer of the sample(s)from the customer to the laboratory. Since any sample may potentially be used as evidence in legal proceedings, it is important that the Chain of Custody Form be filled in completely and accurately.

B. The Chain of Custody Form should furnish an accurate record of the samples received, analyses requested, and any important information from the Client regarding the samples. The information entered on the form should be as complete as possible, including:

1. Client's name and address with zip code
2. Client project manager's name and telephone number
3. Information on custody seals - If present are they intact?
4. Information on Samples:
   a. Is the number of samples listed correctly?

   b. Are all samples individual, or sub-samples of one sample?

   c. Is the description of the samples complete?
   (are samples soil, waste-water, drinking water (if samples are chemicals, a complete description and MSDS information should be furnished.)

   d. Are samples identified correctly? Sample ID numbers or markings should be checked against the Chain of Custody. The date sampled should also be on the chain of custody.

   e. The condition of the samples should be noted.
   - Are samples cool or frozen?
   - Are containers leaking or broken?
   - Damaged containers should be noted on the Sample receipt form under "important information section" and reported to the project manager immediately.

   f. The type of containers must be noted (glass jar, plastic container, brass tube, VOA vial, etc.)

   g. All preservatives added to the samples must be noted on the sample containers and is indicated on the sample pH log form attached to the chain-of-custody.

h. Any inconsistencies in the documentation and samples should be thoroughly investigated. The ideal time to solve a problem is during the log-in process.

5. Analyses requested by the Client must be specific and correspond EXACTLY to our listed analyses profile. If there is any doubt as to the analyses required, the Sample Receiving Person should contact the Client, or the appropriate Lab Manager.

   - In the case where subsamples of the same sample are submitted, and different analyses are requested for each sub-sample, all information and the labeling of each container must be made VERY CLEAR to avoid confusion in the laboratories. EACH CONTAINER MUST HAVE A LAB REQUEST NUMBER and an ORDER NUMBER.

6. Any problems with improper preservation, sample container type, volumes, etc. are to be noted on the Chain of Custody. This is to document problems which may interfere with a proper analysis of the sample. A written copy should also be given to the Lab Project Manager or Customer Representative who may need to contact the customer.

7. The Client should sign in the " Relinquished by " space and also in the " Authorization " space when appropriate.

8. The person receiving the sample(s) must sign the Chain of Custody Form in the "Received by Laboratory for Analysis" space, and record the date and time.

9. When the sample is entered into the Laboratory computer system (a Lab Request Summary is generated) the Lab Request Number should be recorded on the Chain of Custody.

10. Distribution of copies:

    a. Attach the White and Yellow Copy to the Blue Lab Request Summary.

    b. The Pink Copy is given to the Client.

    c. A copy of the Chain of Custody should be attached to all copies of the Lab Request Summary.

    d. All Lab Requests are checked by the appropriate Project Manager.

III. **SAMPLE CONTROL RECORD** (Internal Chain of Custody)

A. A separate Sample Control Record for sample tracking through the laboratory may be initiated by the Sample Receiving Department if this is required by a client or contract (such as EPA/CLP).

B. Information to be entered into the Sample Control Record (refer to the attached copy):

1. The Lab Request Number is written at the top of the Form.

2. The Client's Name and Date is recorded.

3. All individual samples are recorded in the Sample ID space. Samples are identified by the Lab Request Number assigned at the time of sample Log-In. This number is generated by the computer when the sample(s) are logged-in to the computer system.

C. Storage of samples requiring Sample Control Record (Legal Samples).

1. After the samples are logged into the computer system and labeled, they are transferred to a locked storage refrigerator in the Sample Storage Area.

2. Document the transfer of all samples to and from the Sample Custodian with the date and time samples were transferred. Both the Sample Receiving person and Sample Custodian sign the Sample Control Record.

3. For Legal Samples (including EPA/CLP samples), the samples must be kept in locked storage. In this case the Sample Control Record is kept by the designated Sample Custodian who also controls access to the samples. When samples are removed from storage they are logged out on the Sample Control Record which records the date, time and person removing the samples. When the samples are returned they are logged back in with the date, time and initials of the person returning the samples. Samples are not removed from locked storage overnight. The person who removes the samples is responsible for the custody of the samples, and for their return to storage before the end of the working day.

D. Sample Control Record Tracking

1. Each time samples are transferred to or from the Sample Custodian, the Sample Control Record for those samples must be signed.

2. Each person receiving the samples in each department must sign for those samples received and also note the date and time samples are received. Fill in Received By - Dept., Person and Date/Time when samples are delivered to each department and again when the samples are returned to the Sample Custodian.

3. Only one sample control record will be completed for each lab request number (Sample Log In Sheet). No copies are to be made unless clearly labeled as a copy.

4. The Sample Control Record is kept on file by the Sample Custodian and attached to the file when all analyses are completed.

IV. SAMPLE ACCEPTANCE POLICY

Sample acceptance policy determines if the sample is identified correctly, with proper documentation, packaging, adequate volume for the analyses requested and correct preservatives.

1. <u>Sample identification</u> (is the sample waste water, drinking water, hazardous waste,

unknown?). For accurate analysis, the sample and sample source must be identified correctly. If there is an obvious discrepancy between the sample and documentation, this is normally investigated first by the Sample Receiving Personnel. If the problem cannot be resolved, then the appropriate lab manager is notified.

2. Documentation with the sample (is it adequate?). Sufficient documentation should be supplied with the sample to fill in the Chain of Custody completely. If there are any doubts as to the sample identification or analyses requested, the client should be called immediately.

3. Documentation generated during sample login. All communications and decisions regarding the client samples should be documented and signed in writing and attached to the original Lab Sheet (and all copies if necessary).

4. Sample condition (sufficient volume, correct preservative, correct container type, condition of sample, etc). The employee receiving the sample must note on the Chain-of-Custody form or an attached Sample Receipt Form the following information for each sample and fraction:

   a. Container Type (Glass, Amber glass, plastic, brass tube, etc.).

   b. Volume in container (1 L, 500 ml, etc.)

   c. Temperature (Room temp., cool, frozen)

   d. If samples are in a cooler, the temperature in the cooler.

   e. Preservatives added must be listed on the sample container and/or the Chain of Custody form.

   f. The sample must be within the specified holding times for the analyses requested.

   g. Any irregularities noted in the samples (leaking, air bubble in VOA vial, improper packaging, etc.).

5. Responsibility for contacting the customer about problems. The Sample Receiving personnel have primary responsibility for contacting the project manager or client immediately for routine problems with samples. Each client is normally assigned to a project manager, and the person logging the sample is also responsible for informing the project manager of any problems. This may be done with notes on a copy of the lab sheet or chain of custody. Generally all information and decisions must be documented in writing with a date and signature.

6. *A sample receiving checklist must be completed and attached to the final report. See Appendix I for Sample Receiving Checklist.*

V. SAMPLE LOGGING PROCEDURES

A. Description of Computer Logging Procedure:

1. The LIMS system will be used to record and track all samples received at the laboratory. Completed test results should be turned in to the project manager as designated on the Lab Request Summary.

2. Each Department should report the results of all analyses on the blue Results Worksheet and turn this in to the project manager, along with all worksheets and raw data generated in analyzing the samples.

3. When samples are logged into the LIMS system, the system will create one label for each sample container, a Lab Request Summary on blue paper, and a Results Worksheet for each lab department on blue paper. When samples are logged into the LIMS, they are assigned a unique sample number (order number) and all samples in the same group, received on the same day are normally assigned to a unique Lab Request Number.

4. The Sample Receiving personnel will make copies of the login documents as follows: A copy of the Lab Request Summary and the chain-of-custody for each Results Worksheet.

5. Copies of the login documents will be distributed as follows:

   a. Project Manager: The <u>Lab Request Summary</u> and one copy of the Chain of Custody.

   b. Each Department: The blue (original) <u>Results Worksheet</u> + copy of the Lab Request Summary + copy of the Chain of Custody.

   c. Attach the original Chain of Custody to the original Lab Request Summary.

   d. A Posting Log Book is maintained to verify that a copy of the Lab Request and Worksheets was distributed to each affected Department.

6. If problems are noticed with the test codes, analyte list or detection limits (DLR) please correct the Worksheet and give a copy to Jim or Steve <u>as soon as possible</u> so corrections can be made in the LIMS.

B. Description of Lab Request Summary

1. A Lab Request Summary is prepared which includes:

   a. Client name, address and client ID number.

b. Person to whom final report is to be sent.

c. Date sample received.

d. A complete description of the sample(s) including client identification number(s), sample matrix, date /time sampled.

e. A Lab Request Number and an order Number is generated by the computer for each sample.

f. A complete list of all analyses to be completed on each sample, including Method Number, Profile and Service Group / Department.

g. Login information including ID of person logging in the sample, date and time.

h. Order numbers and corresponding customer ID numbers for each sample.

i.A Sample Control Record (Internal Chain of Custody) is completed if needed. This document is used to record the transfer of the samples to departments (see section III).

See Appendix J for a sample of Lab Request Summary.

C. Sample Labeling

Each sample is labeled with the label generated by the computer. The label contains the Lab Request Number, Order Number, Client sample ID and log date.

For Orders where multiple containers are submitted (multiple fractions for different analyses), each separate container (fraction) should be labeled with the order number + A , B , C , etc. to designate fractions for each separate analysis. This fraction designation is then recorded by the custodian and analyst on the sample preparation log to document that the correct sample fraction was analyzed for each analysis method.

D. Procedure for Logging in Additional Analyses.

1. If additional analyses are requested by a client after the samples have been initially logged in and distributed to the labs, an amended Lab Request Summary may be generated for the additional analyses (using the same Lab Request number). The amended Lab Request Summary will note the additional tests in the Comments section.

2. Additional analyses may also be noted using a yellow edit / additional analyses request form to notify all affected departments of the additional tests. Information required is as follows:

a. Name of client

b. Previous Lab ID#
c. Sample type
d. Sample ID
e. Additional analyses
f. Date of request
g. Signature of employee

3. A new Lab Request will be generated if necessary. The new Lab Request Summary will have a new Lab Request Number for the additional analyses, and the samples will be relabeled with the new Lab Request Number. The original Lab Request Number will be retained on the samples.

a. The new Lab Request Summary must clearly reference the original Lab Request number and explain that analyses requested are in addition to the previous analyses (or other reasons for the new Lab Request Summary).

b. Copies of the new Lab Requests are forwarded to all departments affected.

E. **Backup Logging Procedure in Event of Computer System Failure.**

1. Temporary lab Request Summaries have been designed and are available in the Sample Receiving Department.

2. In the event the computer system is non-functional, the Sample Receiving Supervisor will issue temporary lab Request Summaries along with a temporary login reference number (eg. A100).

3. The supervisor will keep a list of assigned numbers and corresponding information (client, departments receiving lab Request Summaries, person writing the ticket).

4. When the computer is functional, standard lab Request Summaries will be issued.Samples that have received temporary numbers will be retrieved and re-numbered with the computer assigned lab Request Numbers. The standard lab Request Summaries will be attached to each corresponding temporary lab Request Summary that was issued.

VI. HANDLING OF THE SAMPLES AFTER LOGGING

A. Handling of the logged-in samples in the laboratory

1. After the samples are logged into the computer system and labeled, they are transferred to the Sample Custodian in the Sample Storage Area. All samples are logged into the Sample Control Log Book organized by Lab Request number. The client name, number and type of containers are entered. The Sample Custodian must sign the Log Book for all containers received.

2. The samples are stored in locked refrigerators or the locked walk-in cooler prior to

analysis.

3. All samples transferred to the Sample Storage Area are logged into a Sample Logbook in the Sample Storage Area. The Sample Logbook is maintained by the Sample Custodian.

4. When samples are picked up by laboratory personnel for analyses, the samples are signed out, and when returned, they are signed back into Sample Storage.

5. When samples are disposed of, this is noted in the Sample Logbook.

6. During weekends and evenings, only designated personnel have access to the Sample storage areas. All samples removed must be documented in the Sample Custodian Logbook.

B. Handling of samples to be sent out to other labs.

1. Arrangements to send samples out for analysis are handled by the project manager and must have the Client's consent.

2. Samples to be transferred to another lab are logged into the LIMS for "Send Out" and the Information is posted on the "Out Board" similar to posting to an in-house department. Samples to be sent out are subsampled and shipped by the Sample Custodian.

2. A portion of each sample to be sent out is retained in the original container. Procedures for sending out samples to other labs is described in the SOP for Subcontracting Analyses and the SOP for Soil Sub-Sampling and Compositing Procedures.

C. Returning samples to the client.

1. When a client requests that the samples be returned to them upon completion of the analyses, the sample receiving personnel should make sure that a notification is made on the lab sheet and that it is clearly visible

2. When all analyses are completed, a note is given to the Sample Custodian listing the samples to be returned and address to be used.

3. If the sample is returned by UPS, the sample pickup record will document that the sample was returned. If the sample is delivered by our driver or picked up by the client, the client should sign the chain of custody or a receipt to show the samples were returned to them. A record book is maintained in Sample Receiving to document the return of samples.

APPENDIX C

Sample Container and Preservation Guide

Updated: March 20, 2002

	Method	Container(1)	Suggested Volume	Preservative	Holding Time(2)
Volatile Organics					
(VFH) Gasoline	(5030) 8015	VOA-glass	2 40ml vials	Cool 4 C	7 days(3)/14 soil
(VFH) Gasoline/BTEX	(5030) 8015/8021	VOA-glass	2 40ml vials	Cool 4 C	7 days(3)/14 soil
Halocarbons	601/8021	VOA-glass	2 40ml vials	Cool 4 C	14 days
Aromatics	602/8021	VOA-glass	2 40ml vials	Cool 4 C	7 days(3)/14 soil
Purgeables	624/8260	VOA-glass	2 40ml vials	Cool 4 C	14 days
Purgeables in DW	524.2	VOA-glass	2 40ml vials	Cool 4 C, Ascorbic acid and HCl	14 days
Semi-Volatile Organics					
(EFH) Diesel	8015 Mod.	glass-amber	1 L	Cool 4 C	7 days/14 soil(4)
Semi-Volatiles (BNAs)	625/8270	glass-amber	1 L	Cool 4 C	7 days/14 soil(4)
Pesticides & PCBs	608/8081	glass-amber	1 L	Cool 4 C	7 days/14 soil(4)
Phosphorous Pests.	614, 622/8140	glass-amber	1 L	Cool 4 C	7 days/14 soil(4)
Herbicides	615/8150	glass-amber	1 L	Cool 4 C	7 days/14 soil(4)
Polynuclear Aromatics	610/8310	glass-amber	1 L	Cool 4 C	7 days/14 soil(4)
Haloacetic Acids	552.2	glass-amber	250 ml	Cool 4 C, 5mg NH4Cl/50ml	14 days(4)
Carbamate Pesticides	632	glass-amber	1 L	Cool 4 C	7 days(4)
Metals					
Mercury	245.1/7470	poly	500 ml	HNO3 to pH<2	28 days
Chromium VI	218.4/7199	poly	500 ml	Cool 4 C	24 hours
Organic Lead	DHS (LUFT)	glass-amber	1 L	Cool 4 C	14 days
All Other Metals	200/6000/7000	poly	500 ml	HNO3 to pH<2	6 months
Inorganic & Wet Chemistry					

Alkalinity	310.1	poly or glass	500 ml	Cool 4 C	14 days
COD	410.4	poly or glass	500 ml	Cool 4 C, H2SO4 to pH<2	28 days
Chloride	300	poly or glass	500 ml	None	28 days
Cyanide	335.1/335.2/9010	poly or glass	1 L	Cool 4 C, NaOH to pH>12(5)	14 days
Flashpoint	1010	poly or glass	500 ml	None	N/A
Fluoride	300.0/340.2	poly or glass	500 ml	None	28 days
Hardness	130.2/SM314B	poly or glass	500 ml	HNO3 or H2SO4 to pH<2	6 months
Nitrate/Nitrite	353.2	poly or glass	500 ml	Cool 4 C	48 hours
Oil & Grease	413.1/413.2	glass-amber	1 L	Cool 4 C, H2SO4 to pH<2	28 days
Phenols	420.1	glass-amber	1 L	Cool 4 C, H2SO4 to pH<2	28 days
Phosphorous	365.2	poly or glass	500 ml	Cool 4 C, H2SO4 to pH<2	28 days
PH	150.1	poly or glass	500 ml	None	Immediate
Solids (TDS, TSS, TS)	160.1/160.2/160.3	poly or glass	500 ml	Cool 4 C	7 days
Specific Conductance	120.1	poly or glass	500 ml	Cool 4 C	28 days
Specific Gravity	SM2710F	poly or glass	500 ml	None	N/A
Sulfate	375.4	poly or glass	500 ml	Cool 4 C	28 days
Sulfide	376.2	poly or glass	500 ml	Cool 4 C, ZnCO2CH3+NaOH pH>9	7 days
TRPH	418.1	glass-amber	1 L	Cool 4 C, H2SO4 to pH<2	28 days
TOC	415.1	glass-amber	250 ml	HCL to pH<2	7 days
TOX	9020	glass-amber	500 ml	HNO3 to pH<2	28 days
Radioactivity	900	Any	1 L	HNO3 to pH<2	7 days
Bioassay (Effluent)	600/4-85/01	poly or glass	5 Gallons	Cool 4C	24 hours

Notes:

(1) Soil samples are typically collected in brass or steel tubes and wide mouth jars (500ml)

(2) Unless otherwise stated, holding times apply to soil and water matrices.

(3) To extend the holding time to 14 days, prepare bottle with HCL to pH<2

(4) Holding times shown are days until extraction. Samples have a 40-day (7-day for 552.2) holding time after extraction.

(5) If chlorinated, add 0.6g Ascorbic Acid

APPENDIX D

Capital Equipment Inventory

Last Update: October 14, 2004

Department	Instrument Description	Quantity	Serial No.	Date
Chemistry	Perkin Elmer FIMS400 Flow Injection Mercury Analyzer with AS90 Autosampler and Data System	1	4543/3670	
Chemistry	Lachat FIA+ Quickchem 8000 Flow Injection Analyzer with Autosampler and Data System	1	A83000-1315	
Chemistry	Lachat Colorimeter (10mm path)	1		
Chemistry	Lachat Manifold (NO2/NO3)	1	10_107_04_O	
Chemistry	Lachat Manifold (NH3-N)	1	10_107_06_1-A	
Chemistry	Lachat Manifold (TKN)	1	10_107_06_2-E	
Chemistry	Lachat Manifold (CN)	1	10_204_00_1-A	
Chemistry	Lachat Manifold (TKP)	1	10_115_01_1-P	
Chemistry	Dionex 2000 Ion Chromatograph with Autosampler, ASRS Supressor, CD20 Conductivity Detector and data system – System I	1	96030596	
Chemistry	Dionex 2000 Ion Chromatograph with Autosampler, ASRS Supressor, ED40 Electrochemical Detector and data system – System I	1	97020907D99100 1	
Chemistry	Dionex 2000 Ion Chromatograph with Autosampler, ASRS Supressor, CD25 Conductivity Detector and data system (perchlorate analysis) – System II	1	01090605	
Chemistry	Dionex 2000 Ion Chromatograph with Autosampler, AD25 Absorbance Detector and data system (hexavalent chromium	1	01120109	

	analysis) – System I1			
Chemistry	Tekmar Dohrman DX-2000 TOX Analyzer with data system	1	98023001	
Chemistry	Beckman DU-50 Spectrophotometer	1	4640062	
Chemistry	Thermo Electron Spectrophotometer	1	AQA 12200B	2004
Chemistry	Mettler AE163 Scale	1	D14314	
Chemistry	Mettler AE163 Scale	1	WB1225	
Chemistry	Mettler AE200 Scale	1	J79480	
Chemistry	Mettler PE3000 Scale	1	F17120	
Chemistry	Denver APX-323 Scale	1	A33015028	
Chemistry	Sartorius BA61 Scale	1	30701480	
Chemistry	Labconco 65200-00 Rapidstill II	1	990192069E	
Chemistry	Fisher Scientific Coulomatic K-F Titrimeter	1	842	
Chemistry	Beckman TJ-6 Centrifuge	1	7A055	
Chemistry	Eppendorf 5415C Centrifuge	1	5415B67934	
Chemistry	Drying Oven Precision/Thelco130DM	1	605031244	
Chemistry	PH Meter Beckman 31	1	K711071	
Chemistry	PH Meter Thermo ORION	1	67511	
Chemistry	PH Meter Thermo ORION	1	57736	
Chemistry	Turbidity Meter Hach 2100N	1	99020000-5174	
Chemistry	Conductivity Meter Cole Palmer 19101-10	1	02050211056-101	
Chemistry	Fume Hoods	6		
Fish Toxicity	4 Gallon Tanks	40		
Fish Toxicity	Disposable Tanks (approx. 3 Gallons each)	100		
Fish Toxicity	30 Gallon Tank	3		
Fish Toxicity	20 Gallon Tank	1		
Fish Toxicity	Air Pumps	10		
Fish Toxicity	Circulation Pump	1		
Fish Toxicity	pH Meter	1		
Fish Toxicity	Recording Thermograph	1		
Fish Toxicity	YSL Model 50B DO Meter	1		
GC	Varian 3400 GC with FID & PID (#3w)	1		1991
GC	Varian 3400 star GC with FID & PID, autosampler and data system (# 1)	1		1989
GC	Varian 3300 GC with FID & PID, autosampler and data system (# 2)	1		1989
GC	Varian 3400 GC with FID, autosampler and data system (#	1		1989

	3)			
GC	Varian 3400 GC with FID, autosampler and data system (# 9)	2		1986
GC	Varian CP-3800 GC with FID & PID, autosampler and data system (# 14)	1		1999
GC	Varian CP-3800 GC with FID & PID, autosampler and data system (# 15)	1		2004
GC	Varian 3300 GC with FID, and data system (# 12)	1		1986
GC	Varian 3400 GC with PID (Traacor 1000 HALL Detector attached), autosampler and data system (# 4)	1		1989
GC	Varian 3400 GC with FID, Varian 8100 autosampler and data system (# 5)	1		1990
GC	Varian 3400 GC with TCD (# 8)	1		1988
GC/MS	Varian Model 3800 gas chromatograph with Varian Saturn 2200 MS Detector, Autosampler and Data Station (#7)	1	04575-10060	2003
GC/MS	Varian Model 3800 gas chromatograph with Varian Saturn 2000 MS Detector, Autosampler and Data Station (#6)	1	4443-6028	2001
GC/MS	Varian Model 3800 gas chromatograph with Varian Saturn 2000 MS Detector, Autosampler and Data Station (#5)	1	3810-3780	1999
GC/MS	Varian Model 3800 gas chromatograph with Varian Saturn 2000 MS Detector, Autosampler and Data Station (#4)	1	3811-3781	1999
GC/MS	Varian Model 3800 gas chromatograph equipped with Varian Saturn Model 2000 MS Detector (#3), Autosampler and Data Station	1		2005

GC/MS	Agilent 6890N gas chromatograph with a Agilent 5973 Mass Selective Detector and a Agilent 7683B automatic injector	1	CN10502043 US44647151 Cn45131647	2005
GC/MS	Varian Model 3800 gas chromatograph equipped with Varian Saturn Model 2000 MS Detector, 2 flame ionization detectors, and a Lotus air sampling system.	1		
Microbiology	Castle Thermatic 60, 20x24 Autoclave, Automatic	1		
Microbiology	Market Forge Sterilmatic Autoclave	1		
Microbiology	Wesco, 4 Objective Microscope	1		
Microbiology	B&L Dissecting Microscope	1		
Microbiology	"Filamatic" Media Pipettor	1		
Microbiology	Blue M Magni-Whirl Constant Temperature Bath	3		
Microbiology	Neslab 500 Water Bath	3		
Microbiology	Lab-Line Imperial III Incubator	1		
Microbiology	Thelco Incubator	1		
Microbiology	Precision Scientific Incubator	1		
Microbiology	Baush & Lomb Refractometer	1		
Microbiology	VWR 1555 Incubator	1		
Microbiology	VWR Incubator, 40 cubic ft.	1		
Microbiology	Lab-Line Orbiter Environmental Shaker	1		
Microbiology	Bio-Rad Mini-Transilluminator	1		
Microbiology	Bio-Rad AC Power Supply	1		
Microbiology	Baxter Scientific Product Vortex Mixer	1		
Microbiology	Sartorium Universal Balance	1		
Microbiology	Quebec Colony Counter	1		
Office Data Handling	Toshiba Fax	2		
Office Data Handling	Canon Copiers	4		
Office Data Handling	LIMs Computer System (39 stations)	1		
Office Data Handling	HP Laserjet Printers	3		
Office Data Handling	Lexmark Printers	13		
Pesticides	Hewlett Packard 5890A Series II GC, dual ECD detectors, Autosampler and Data Station	1	3022A28956	1990

Pesticides	Varian 3400 GC, dual ECD detectors, Autosampler (GC-3400)	1	14304	1991
Pesticides	Varian 3800 GC, dual ECD detectors, Autosampler (GC#1)	1	2771	
Pesticides	Varian 3800 GC, dual ECD & PFPD detectors, Autosampler (GC#2)	1	6056	2000
Pesticides	Varian 3800 GC, dual ECD & PFPD detectors, Autosampler (GC#3)	1	9085	2000
Pesticides	Varian 3400 GC, FID detector, Autosampler (GC-Alcohol)	1	6692	1989
Pesticides	Waters Dimension II GC, ECD & FID detectors, data system	1	GC2-8901009	
Pesticides	Varian 9100 HPLC with UV-Vis, RI, Fluorescence Detectors, Autosampler and data system	1	3021	1994
Pesticides	Shimadzu SCL-10A VP System Controller, LC-10AT Pumps, Autosampler, SPD-M10A VP Diode Array Detector, Data System	1	C2103750927US	2000
Pesticides	Shimadzu GC-2010, dual injectors, dual ECD detectors (ECD#1, ECD#2), Autosampler and workstation	1	C11324101922	2003
Pesticides	Dionex ASE 200 Accelerated Solvent Extractor and Controller	1	1060057	2001
Pesticides	Dionex ASE 200 Accelerated Solvent Extractor and Controller	1	97060620	2000
Pesticides	Zymark Turbo Vap II Concentration Workstations	3		2000
Pesticides	Ohaus Brainweight B1500D Toploader Balance	1	11532	
Pesticides	Boekel 1494 Steambath	1		
Pesticides	Fisher Isotemp 228 Steambath	2		2000
Pesticides	Fume Hoods	5		
Pesticides	Varian 3300 GC (Drying Oven)	1	5415	1988
Pesticides	B. Braun Braun-Sonic U Ultrasonic probe and generator	1		
Pesticides	VWR 1350G Drying Oven, gravity	1		
Pesticides	Precision Scientific 16 Drying Oven, gravity	1		
Pesticides	National Appliance Drying Oven, gravity	1		

TOC/RAD	Gas-Flow proportional counting system -- Protean Instr., Model 9025.	1		1991
TOC/RAD	Geiger-Mueller Counter (portable) -- S.E. Intl. Model 4EC	1		1991
TOC/RAD	Infrared Heater and Stand (Fisher Scientific, Model 11-504-5	1		1991
TOC/RAD	Labconco Model 59000 Chemical Fume Hood	1		1991
TOC/RAD	Mettler Model H35AR Analytical Balance	1		
TOC/RAD	Dessicator, Nalgene Model 8-642-21	1		1991
TOC/RAD	TOC Analyzer, Shimadzu, TOC-5000	1		
TOC/RAD	Shimadzu TOC-VCSH Total Organic Carbon Analyzer, A/S and Data System	1		2004
AA/ICP Metals	PE Sciex Elan 6100 ICP-MS with auxiliary data system and autosampler	1		2000
AA/ICP Metals	Perkin Elmer Optima 4300DV ICP with autosampler and data system			2001
AA/ICP Metals	Perkin Elmer Aanalyst 100 AA	1		2001
AA/ICP Metals	TCLP Rotary Agitators	2		
AA/ICP Metals	TCLP ZHE Extractors	4		
AA/ICP Metals	TCLP Pressure Filters	2		
AA/ICP Metals	Fume Hoods	2		
AA/ICP Metals	Environmental Express Hot Blocks	3		

APPENDIX E

STANDARD OPERATING PROCEDURE FOR DETERMINATION AND UPDATING OF MDL/DLR DETECTION LIMITS

PURPOSE

1. This Standard Operating Procedure summarizes the procedure for determining MDLs (Method Detection Limit) and DLR (Reporting Detection Limit), in addition to the procedure for updating and revising current MDLs and DLRs.

DETERMINATION OF MDL

1. Prepare and analyze seven replicate spike solutions:

   1.1. Prepare one spiked bulk solution for each matrix at 1-5 times the estimated detection limit. The volume should be sufficient to prepare and analyze seven or more samples. The solution should be spiked with all analytes of interest.

   1.2. Prepare seven or more aliquots of the spiked solution per the normal method of preparation (process through the entire analytical method).

   1.3. Analyze all the aliquots by normal analysis procedures (QA samples such as spikes, duplicates, LCS and PB are not required).

   1.4. Calculate the standard deviation (n-1) of the seven results. For seven replicates multiply by 3.14 to calculate the MDL value for each analyte. (**NOTE:** Use the factor 3.14 only for seven replicates, other factors are given in the EPA reference noted below).

   1.5. More than 7 aliquots can be analyzed. If more than 7 aliquots are analyzed, then all values must be used in calculating the MDL. Use the Student's t value at the 99% confidence level for the number of replicates.

2. The MDL should be determined at least once a year for each analyte, each analytical method and each matrix (solid, water, etc). The MDL should be re-run whenever there is a significant change in instrumentation or procedure.

3. An MDL check sample at approximately 2 x MDL should be analyzed to verify the reasonableness of the MDL values obtained. The MDL check sample should be prepared the same way as the MDL check solutions. All analytes should be detected in the MDL check sample, or the MDL study should be modified and repeated for the analytes which are not detected.

DETERMINATION OF REPORTING DETECTION LIMIT (DLR)

1. Prepare and analyze one or more samples at the estimated reporting limit:

    1.1. Prepare one or more samples at the estimated reporting limit using the normal preparation procedure (process through the entire analytical method). QA samples such as spikes, duplicates, LCS and PB are not required.

    1.2. Analyze the sample by the normal analysis procedure.

    1.3. The analytical result must be 75-125 percent of the spike value. If not, increase the concentration until this accuracy can be achieved.

2. The concentration at which the spike recovery of 75-125% can be achieved is the Reporting Detection Limit (DLR).

UPDATING & REVISING MDL/DLR VALUES:

1. Every year, each department is required to submit their MDLs for each analyte and each analytical method to the QC department.

2. The QC department will then incorporate the current MDLs into the LIMS system for each analytical method (**NOTE:** In the LIMS, there may be several test codes for a particular analytical method. It is important that the MDLs for ALL test codes in the LIMS be updated).

3. After the MDLs for a particular test have been changed, the specs for that test are printed out and kept on file by the QC department, and a copy is returned to the analyst.

4. The QC department shall keep track of all changes in the MDLs through an MDL Master Tracking List, which contains the following information:

    4.1. The date the MDL for a particular test was updated.

    4.2. The date the MDL was run.

    4.3. The LIMS test code and test name for each test in which the MDLs have been updated.

    4.4. The corresponding analytical method for each test.

    4.5. Any additional comments for documenting any pertinent information or noting any unusual peculiarities in the database (e.g., some analytes that are missing DLRs, MDLs that are greater than the DLR, etc.).

5. The MDL must never exceed the DLR. If the MDL is equal to or greater than the DLR then the following steps must be taken:

    5.1. If the MDL is greater than the DLR for one or more analytes, then the MDL should be re-run or the DLR should be adjusted if possible.

5.2. If the MDL is equal to the DLR, then this must be reviewed by the QC department as well as the department supervisor to determine if such a scenario is acceptable.

5.3. All cases in which the MDL is greater than or equal to the DLR, including any steps taken to remedy the situation, must be noted in the MDL Master Tracking List.

REFERENCES:

1. 40 CFR, Chapter 1, Pt. 136, App.B (7-1-86 Ed).

2. NELAC Quality Systems Revision 16, July 12, 2002.

APPENDIX F

NON-CONFORMANCE CRITERIA AND DOCUMENTATION PROCEDURES

QA Samples - Corrective Actions:

1. Lab Control Sample (LCS- W for water samples, S for soil samples), the acceptance criteria for the LCS is 80 - 120 percent of true value or the current control limits. If not, all samples in the batch must be re-prepared and re-analyzed.

2. Method Blank (MBW for water samples, MBS for soil samples), the result must be less than the reporting limit for each element, or less than 1/10 the lowest sample in the batch. If not, all samples in the batch must be re-prepared and re-analyzed.

3. Matrix Spike Sample (MS), recovery should be 75 - 125, if not the sample result should be flagged for potential matrix interference for each element showing poor recovery. (For metals analyses, a post- digestion spike should be done for any element with poor matrix spike recovery).

4. Matrix Spike Duplicate (MSD), the relative percent difference between the MS and MSD should be less than 20 percent. If not the analysis should be repeated or the result flagged for precision out of limits.

5. Surrogate Recovery, the surrogate recoveries should be within the current control limits for all methods where surrogate recoveries apply. If the surrogate recoveries are outside control limits, the results should be flagged for potential matrix interference for each analyte showing recovery outside the control limits. If the surrogate recoveries for the LCS or Method Blank are outside control limits, all samples in the batch must be re-prepared / re-analyzed, unless it can be determined that the poor recovery was due to a problem specific to that sample only.

Non-conformance Documentation Form (NCD):

1. Non-conformances such as QA limit failures which can not be corrected by re-analyses, client requirements which cannot be met or standard method modifications are documentated by initiating a Non-Conformance Document Form (NCD). A copy of the NCD Form is attached.

2. The NCD form is initiated by the analyst in the event of a QC sample exceeding control limits or other known non-conformance to the analytical method or client requirements. The NCM may also be initiated by the project manager or department manager in the event client requirements are not met or other analytical problems are discovered.

3. After the NCD Form is initiated, the corrective action must be determined and agreed upon by the department manager or supervisor and the QA Manager. This is documented and signed by the department manager in the second part of the NCD

Form. The form is then forwarded to the QA Manager.

4. The QA Manager then completes and signs the final part of the form. If necessary, verification of the corrective action is documented in this section.

5. A copy of the form is included in the affected data package or the client is notified as appropriate. The original is filed in the Corrective Actions File which is maintained by the QA Manager.

Associated Laboratories

Non-Conformance Document

Date: ____________________________ Document File #: __________________

Lab Request: ____________________ Type of

NCD:____________________

Client ID: _______________________ (*QA Limits, Client Req, Other)*

Department: _____________________

Description of Non-Conformance:
Signed (Initiator) ________________________ Date: ___________

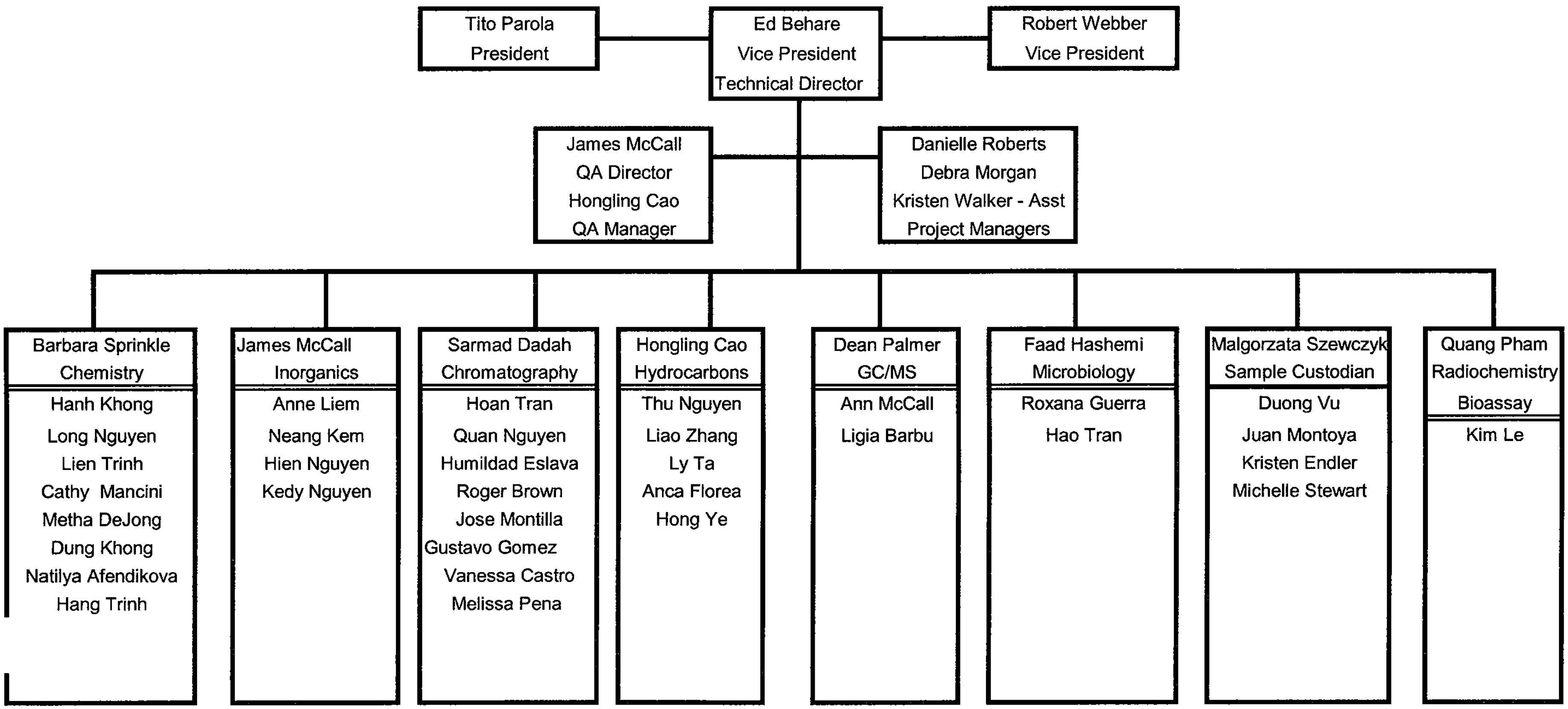
Description of Corrective Action:
Signed (Supervisor): ____________________ Date: _____________

QA Manager Approval:
Signed (QA Manager): ___________________ Date: _____________

APPENDIX G

ORGANIZATION CHART

ASSOCIATED LABORATORIES
LAB ORGANIZATION CHART



APPENDIX H

CURRENT STANDARD OPERATING PROCEDURES

Document #	**SOP**	**Test Method (if applicable)**	**Department**
A-0001	SOP for Writing SOPs		QC
A-0002	Updating/Control of SOPs		QC
QA Manual	SOP for MDLs		QC
A-0004	Control Charts		QC
QA Manual	Non-Conformance		QC
A-0006	Data Packaging		QC
A-0007	Ethics and Data Integrity Policies and Training		QC
A-0008	Internal Quality Audit Program		QC
A-0009	Purchasing services and supplies		QC
A-0010	Document Control		QC
A-0011	Subcontracting Laboratory Analyses		QC
A0012	Data Backup and Verification Procedure		QC
A0013	Data Auditing and Access Procedures		QC
B-0001	14	EPA 502.2	Gas/BTEX
B-0002	Purgeable Organics	EPA 601/601	Gas/BTEX
B-0003	8015 Diesel SOP	EPA 8015 Diesel	Gas/BTEX
B-0004	8015 gas/BTEX SOP	EPA 8015 Gas/8021 BTEX	Gas/BTEX
B-0005	TRPH SOP	EPA 418.1	Gas/BTEX
B-0006	HVO/AVO	EPA 8021B	Gas/BTEX
B-0007	Dissolved Gas in Water by GC Headspace	RSK - 175	
C-0001	Purgeable Organics	EPA 524.2	GC/MS
C-0002	Purgeable Organics	EPA 624	GC/MS
C-0003	SVOCs by GC/MS	EPA 625	GC/MS
C-0004	VOCs by GC/MS	EPA 8260B	GC/MS
C-0005	SVOCs by GC/MS	EPA 8270C	GC/MS
D-0001	Acidity	EPA 305.1 / SM 2310B	Chemistry
D-0002	Alkalinity	EPA 310.1 / SM 2320B	Chemistry
D-0003	pH	EPA 150.1 / SM 4500H-B	Chemistry
D-0004	TDS	EPA 160.1 / SM 2540C	Chemistry
D-0005	TSS	EPA 160.2 / SM 2540D	Chemistry

D-0006	Volatile Solids	EPA 160.4 / SM 2540E	Chemistry
D-0007	Anions by IC	EPA 300 / SM 4110	Chemistry
D-0008	Bromide by IC	EPA 300.1	Chemistry
D-0009	Perchlorate	EPA 314	Chemistry
D-0010	Cyanide	EPA 335.1 & 335.2 / SM 4500-CN / SW846 9010B	Chemistry
D-0011	Ammonia-N	EPA 350.1 / SM 4500-NH3-G	Chemistry
D-0012	TKN	EPA 351.2 / SM 4500-Norg	Chemistry
D-0013	TKN	EPA 351.3 / SM 4500-Norg	Chemistry
D-0014	Nitrate/Nitrite-N	EPA 353.2 / SM 4500-NO3-E	Chemistry
D-0015	Total/Ortho-P	EPA 365.2	Chemistry
D-0016	TKP	EPA 365.4	Chemistry
D-0017	Mercury in Water	EPA 245.1 / SW846 7470A	Chemistry
D-0018	Reactive Cyanide	SW846-7.3.3	Chemistry
D-0019	Reactive Sulfide	SW846-7.3.4	Chemistry
D-0020	Oil & Grease	EPA 1664	Chemistry
D-0021	BOD	EPA 405.1 / SM 5210B	Chemistry
D-0022	COD (Hach)	EPA 410.4	Chemistry
D-0023	Silica	EPA 370.1 / SM 4500 Si-D&E	Chemistry
D-0024	Sulfide (Iodometric)	EPA 376.1 / SM 4500S / SW846 9034	Chemistry
D-0025	Oil & Grease	SM 5520	Chemistry
D-0026	Total Phenolics	EPA 420.1 / SM 5530 / SW846 9065	Chemistry
D-0027	Chlorine	EPA 330.5 / SM 4500Cl-G	Chemistry
D-0028	UV absorbance	SM 5910B	Chemistry
D-0029	Settleable Solids	EPA 160.5 / SM 2540F	Chemistry
D-0030	Conductivity	EPA 120.1 / SM 2510 / SW846 9050A	Chemistry
D-0031	Turbidity	EPA 180.1 / SM 2130B	Chemistry
D-0032	Corrosivity	EPA 1110	Chemistry

D-0033	COD (Titrimetric)	EPA 410.1, 410.2 & 410.3 / SM 5220B	Chemistry
D-0034	TOX	SM 5320B / SW846 9020B	Chemistry
D-0035	Ignitability	SW846 1010	Chemistry
D-0036	Sulfide (Colorimetric)	EPA 376.2 / SM 4500S-D	Chemistry
D-0037	Fluoride	EPA 340.2 / SM 4500F-C / SW846 9214	Chemistry
D-0038	Cyanide	EPA 335.4 / SW846 9012A	Chemistry
D-0039	Ammonia-N (Titration)	EPA 350.2 / SM 4500-NH3-C	Chemistry
D-0040	Total Solids	EPA 160.3 / SM 2540B	Chemistry
D-0041	Color	EPA 110.2 / SM 2120B	Chemistry
D-0042	Cr (VI)	SM 3500 Cr-D / SW846 7196A	Chemistry
D-0043	Cr (VI) by IC	EPA 218.6	Chemistry
D-0044	Sulfate	EPA 375.3 / SM 4500-SO4 C	Chemistry
D-0045	MBAS	EPA 425.1 / SM 5540C	Chemistry
D-0046	Chloride (titration)	EPA 325.3 / SM 4500-Cl	Chemistry
D-0047	DO (Probe)	EPA 360.1 / SM 4500-O-G	Chemistry
D-0048	DO (Titration)	EPA 360.2 / SM 4500-O-C	Chemistry
D-0049	pH in Soil	SW846 9045C	Chemistry
D-0050	Mercury in Solid	SW846 7471A	Chemistry
D-0051	Total Sulfides	SW846 9030B	Chemistry
E-0001	Micro- CC	Control Cultures	Microbiology
E-0002	Micro-CPA	Coliform by CPA	Microbiology
E-0003	Micro-WS	Water Suitability	Microbiology
E-0004	Micro-HPT	Heterotrophic Plate Count	Microbiology
E-0005	Micro-MNO/MUG	Coliform by MNO-MUG	Microbiology
E-0006	Micro - Coliform (MF)	Coliform by MF in Drinking Water	Microbiology
E-0007	Micro - Coliform (MF)	Coliform by MF in Wastewater	Microbiology
E-0008	Micro - Strep (MF)	Strep by MF	Microbiology

E-0009	Micro - Coliform (MTF)	Coliform by MTF in Drinking Water	Microbiology
E-0010	Micro - Coliform (MTF)	Coliform by MTF in Waste Water	Microbiology
E-0011	Micro - Strep (MTF)	Strep by MTF	Microbiology
E-0012	Micro - Autoclave		Microbiology
E-0013	Micro - Inhibitory Residue		Microbiology
E-0014	Micro Sampling		Microbiology
F-0001	Metals by ICP	EPA 200.7	Metals
F-0002	Metals by ICP	EPA 6010B	Metals
F-0003	Metals by ICP-MS	EPA 200.8	Metals
F-0004	Metals by ICP-MS	EPA 6020	Metals
F-0005	Metals by AA	EPA 7420 / SM 3111B	Metals
F-0006	STLC	STLC	Metals
F-0007	TCLP	EPA 1311	All applicable labs
F-0008	Metals Prep	EPA 3010A	Metals
F-0009	Metals Prep	EPA 3050B	Metals
G-0001	TOC	EPA 415.1 / SM 5310B	Radio/Bioassay
G-0002	Gross Alpha/Beta	EPA 900	Radio/Bioassay
G-0003	Gross Radium	EPA 900.1	Radio/Bioassay
G-0004	Gross Alpha by Co-precipitation	SM 7110C	Radio/Bioassay
G-0005	Aquatic Bioassay 013	EPA 600/4-85/013	Radio/Bioassay
G-0006	Reference Toxicant 013	EPA 600/4-85/013	Radio/Bioassay
G-0007	Aquatic Bioassay 027F	EPA 600/4-85/027F	Radio/Bioassay
G-0008	Reference Toxicant 027F	EPA 600/4-85/027F	Radio/Bioassay
G-0009	Aquatic Bioassay in Hazardous Waste		Radio/Bioassay
G-0010	Reference Toxicant in Hazardous Waste		Radio/Bioassay
H-0001	Organochlorides	EPA 608	Pesticides
H-0002	Organochlorides	EPA 8081	Pesticides
H-0003	PAHs	EPA 8310	Pesticides
H-0004	PCBs	EPA 8082	Pesticides
H-0005	Chlorinated Phenoxy-Herbicides by GC	EPA 8151	Pesticides
H-0006	L-L Extraction	EPA 3510C	Pesticides
H-0007	Ultrasonication	EPA 3550B	Pesticides

H-0008	PF Extraction	EPA 3545	Pesticides
H-0009	EDB, DBCP & TCP by GC	EPA 504.1	Pesticides
H-0010	EDB & DBCP by GC	EPA 8011	Pesticides
H-0011	OP Pesticides by GC	EPA 8141	Pesticides
H-0012	Haloacetic Acids	EPA 552.2	Pesticides
J-0001	Inorganics Glassware Cleaning		All applicable labs
J-0002	Thermometer Cal.		All applicable labs
J-0003	Balance Calibration		All applicable labs
J-0004	Reagent Water Mon.		All applicable labs
J-0005	Pipette Calibration		All applicable labs
J-0006	Sample Receiving		Sample Receiving
J-0007	Soil Sub-Sampling and Compositing		All applicable labs
J-0008	Field Sampling		Sample Receiving
J-0009	Organic Glassware Cleaning		All applicable labs
J-0010	Laboratory Hazardous Waste Disposal		All applicable labs
J-0011	Analytical Standards		All applicable labs
J-0012	Project Management		All applicable labs
J-0013	Retention Time Windows		All applicable labs

SOP Revision Schedule

Department	Document #	SOP Revision Month
QC	A-####	June
Gas/BTEX	B-####	June
GCMS	C-####	June
Chemistry	D-####	July
Microbiology	E-####	July
Metals	F-####	August
Radiochemistry/Bioassay/ TOC	G-####	August
Pesticides	H-####	September
Others	J-####	September

APPENDIX I

SAMPLE RECEIVING CHECKLIST

ASSOCIATED LABORATORIES
806 North Batavia – Orange, California 92868 – 714-771-6900 FAX 714-538-1209

SAMPLE ACCEPTANCE CHECKLIST

Section 1
Client:____________________________ Project:_____________________________
Date Received:______________________
Sample(s) received in cooler: Yes No (Skip Section 2)

Section 2
Was the cooler packed with: ____ Ice ____ Ice Packs ___ Bubble Wrap ___ Styrofoam
____ Paper ____None ___ Other______________________
Cooler or box temperature: ___________________________

(Acceptance range is 2 to 6 Deg. C.)

Section 3	YES	NO	N/A
Was a COC received?			
Were custody seals present?			
If Yes – were they intact?			
Were all samples sealed in plastic bags?			
Did all samples arrive intact? If no, indicate below.			
Did all bottle labels agree with COC? (ID, dates and times)			
Were correct containers used for the tests required?			
Was a sufficient amount of sample sent for tests indicated?			
No head space in VOA vials?			
Were the correct preservatives used?			
Were the samples scanned for presence of radioactivity?			

Section 4
Explanations/Comments

Section 5
Was Project Manager notified of discrepancies: Y / N N/A

Completed By: ____________________________ Date: ___________________________

APPENDIX J

SAMPLE OF LAB REQUEST SUMMARY

ASSOCIATED LABORATORIES LAB REQUEST SUMMARY

Client ID: **1000**

Some Client
Attn: BB
1234 Marvel Way
New York, NY 20007

Phone:209-200-2001 Fax: 209-200-2002

Submitter: Client

Project: Some Project

Lab Request: 158450

Date Received: 10/17/2005

Project Mgr.: JMM

REVIEW	BY	DATE
LOG IN		
DATA		
QC		
FINAL RPT		

FAX RESULTS

Order No.: 658819 **Matrix:** WATER **Log Date:** 10/17/2005@15:15 **Due Date:** 10/24/2005
Client Smpl. ID: Sample 1 **Sampled:** 10/17/2005 **Status:** Logged

Method	Profile	Test Name	Analyte	Service Group
120.1		120.1 Conductivity	All	CHEM
150.1		150.1 pH	All	CHEM
1664		1664 Oil and Grease	All	CHEM
300.0		300.0 Nitrate as NO3 by Ion Chromatography	All	CHEM
300.0		300.0 Sulfate by Ion Chromatography	All	CHEM
300.0		300.0 Chloride by Ion Chromatography	All	CHEM

Order No.: 658820 **Matrix:** WATER **Log Date:** 10/17/2005@15:15 **Due Date:** 10/24/2005
Client Smpl. ID: Sample 2 **Sampled:** 10/17/2005 **Status:** Logged

Method	Profile	Test Name	Analyte	Service Group
200.7		200.7 ICP Total Metals - Water Only	Calcium	AA/ICP
200.7			Copper	AA/ICP
200.7			Lead	AA/ICP
200.7			Magnesium	AA/ICP
200.7			Potassium	AA/ICP
200.7			Sodium	AA/ICP
245.1		245.1 Mercury in Water by Manual Cold	All	CHEM

Logged By: JIM

CHEM

ASSOCIATED LABS RESULTS WORKSHEET FOR LAB REQUEST 158,450

Order #: 658819 **Client Smpl ID:** Sample 1 **Matrix:** WATER

Test #	Analyte	An. Date	Init.	DF	Result	DLR	Units
120.1	Conductivity					1.0	umhos/cm
150.1	pH						NA
1664	Non-Polar Oil and Grease					5	mg/L
1664	Total Oil and Grease					5	mg/L
300.0	Chloride					1.0	mg/L
300.0	Nitrate (as NO3)					0.44	mg/L
300.0	Sulfate					1.0	mg/L

Comments:

Order #: 658820 **Client Smpl ID:** Sample 2 **Matrix:** WATER

Test #	Analyte	An. Date	Init.	DF	Result	DLR	Units
245.1	Mercury					0.0004	mg/L

Comments:

DLR = Detection limit for reporting purposes. DF = Dilution factor. An. Date = Date of analysis. Init = Analyst initials

ASSOCIATED LABS RESULTS WORKSHEET FOR LAB REQUEST 158,450

Order #: 658820 **Client Smpl ID:** Sample 2 **Matrix:** WATER

Test #	Analyte	An. Date	Init.	DF	Result	DLR	Units
200.7	Calcium					0.10	mg/L
200.7	Copper					0.010	mg/L
200.7	Lead					0.005	mg/L
200.7	Magnesium					0.10	mg/L
200.7	Potassium					0.50	mg/L
200.7	Sodium					0.10	mg/L

Comments:

DLR = Detection limit for reporting purposes. DF = Dilution factor. An. Date = Date of analysis. Init = Analyst initials

APPENDIX K

LISTING OF CALIFORNIA ELAP ACCREDITED ENVIRONMENTAL METHODS

Associated Laboratories

California DHS Accredited Tests

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CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

ASSOCIATED LABORATORIES
Certificate No: 1338

Field of Testing: 01 - Microbiology of Drinking Water and Wastewater

01.01A	01	Total and Fecal Coliform	SM9221A,B,E
01.01B	01	Total Coliform and E. coli;	SM9221A,B,C/CFR 141 .21(f)(6)(i)
01.02A	01	Total and Fecal Coliform	SM9222A,B,C, 9221E
01.03	00	Total Coliform and E. coli	SM9223
01.03	02	Total Coliform and E. coli	Colisure
01.05	01	Heterotrophic Plate Count	SM9215B
01.06	01	Total Coliform	SM9221 B
01.07	01	Fecal Coliform	SM9221C,E
01.08	01	Total Coliform	SM9222B
01.09	01	Fecal Coliform	SM9222D
01.10	01	Fecal Streptococci/Enterococci	SM9230B
01.11	01	Fecal Streptococci/Enterococci	SM9230C
01.12	01	Total Coliform	SM9221A,B,C
01.13	00	Fecal Coliform	SM9221E
01.14	01	Total Coliform	SM9222A,B,C
01.15	01	Fecal Coliform	SM9222D

Field of Testing: 02 - Inorganic Chemistry and Physical Properties of Drinking Water

02.01	01	Alkalinity	SM2320B
02.02	01	Calcium	SM3500-Ca D
02.02	02	Calcium	SM3111B
02.02	03	Calcium	SM312OB
02.02	04	Calcium	EPA 200.7
02.03	02	Chloride	SM411OB
02.03	03	Chloride	EPA 300.0
02.05	03	Fluoride	SM4500-F C
02.05	04	Fluoride	SM41 Lob
02.05	05	Fluoride	EPA 300.0
02.06	02	Hardness	SM2340B
02.07	01	Magnesium	SM3111B
02.07	02	Magnesium	SM31 20B
02.07	03	Magnesium	EPA 200.7
02.08	01	MBAS	SM5540C
02.09	02	Nitrate	SM41 IOB
02.09	03	Nitrate	EPA 300.0
02.09	05	Nitrate	SM4500-N03 F
02.09	06	Nitrate	EPA 353.2
02.10	01	Nitrite	SM4500-N02 B
02.10	02	Nitrite	SM41 IOB
02.10	03	Nitrite	EPA 300.0
02.10	05	Nitrite	SM4500-N03 F
02.10	06	Nitrite	EPA 353.2
02.11	01	Sodium	SM3111B
02.11	02	Sodium	SM3126B
02.11	03	Sodium	EPA 200.7

02.12	01	Sulfate	SM411OB
02.12	02	Sulfate	EPA 300.0
02.12	03	Sulfate	SM4500-S04 C,D
02.I3A	01	Total Dissolved Solids	SM2540C
02.13B	01	Conductivity	SM251 OB
02.16	01	Phosphate, Ortho	SM4500-P E
02.17	01	Silica	SM4500-Si F
02.17	02	Silica	SM4500-Si D
02.17	03	Silica	SM4500-Si E
0217	05	Silica	EPA 200.7
02.18	01	Cyanide	SM4500-CN C, G
02.18	02	Cyanide	SM4500-CN C, E
0218	03	Cyanide	SM4500-CN C, EPA 335.4
02.19	01	Potassium	SM3111B
02.19	03	Potassium	SM31 20B
02.19	04	Potassium	EPA 200.7
02.20	01	Chlorate	EPA 300.0
02.21	01	Chlorite	EPA 300.0
02.22	01	Bromate	EPA 300.0
02.23	01	Bromide	EPA 300.0
02.24	01	Perchlorate	EPA 314.0
02.25	03	Combined & Total Chlorine	SM4500-Cl G
02.29	01	Total Organic Carbon	SM531OB
02.29	02	Total Organic Carbon	EPA 415.1
02.30	01	TOC/DOC	SM531 OB
02.31	01	UV254	SM591 OB
Field of Testing: 03 - Analysis of Toxic Chemical Elements in Drinking Water			
03.01	05	Arsenic	EPA 200.7
03.01	06	Arsenic	EPA 200.8
03.02	04	Barium	EPA 200.7
03.03	04	Cadmium	EPA 200.7
03.03	05	Cadmium	EPA 200.8
03.04	04	Chromium, Total	EPA 200.7
03.04	05	Chromium, Total	EPA 200.8
03.05	05	Copper	EPA 200.7
03.05	06	Copper	EPA 200.8
03.06	01	Iron	SM3111B
03.06	05	Iron	EPA 200.7
03.07	03	Lead	EPA 200.8
03.08	05	Manganese	EPA 200.7
03.08	06	Manganese	EPA 200.8
03.09	02	Mercury	EPA 245.1
03.09	04	Mercury	EPA 200.8
03.10	04	Selenium	EPA 200.8
03.11	05	Silver	EPA 200.7
03.11	06	Silver	EPA 200.8
03.12	03	Zinc	EPA 200.7
03.12	04	Zinc	EPA 200.8
03.13	05	Aluminum	EPA 200.7
03.13	06	Aluminum	EPA 200.8
03.15	03	Antimony	EPA 200.8
03.16	04	Beryllium	EPA 200.7
03.17	05	Nickel	EPA 200.7
03.17	06	Nickel	EPA 200.8
03.18	02	Thallium	EPA 200.8
03.19	01	Chromium (VI)	EPA 218.6

03.20	01	Boron	EPA 200.7
03.20	02	Boron	EPA 200.8
03.21	01	Vanadium	EPA 200.8
Field of Testing: 04 - Organic Chemistry of Drinking Water by GC/MS			
04.02A	01	Volatile Organic Compounds	EPA 524.2
04.02B	01	Unregulated Volatiles	EPA 524.2
04.020	01	Vinyl Chloride	EPA 524.2
04.02D	01	Trihalomethanes	EPA 524.2
04.02E	01	MTBE, DIPE, TAME, ETBE	EPA 524.2
04.02E	01	MTBE, DIPE, TAME, ETBE	EPA 524.2
04.02F	01	Freon 11 & 113	EPA 524.2
Field of Testing: 05 - Organic Chemistry of Drinking Water (excluding GC/MS)			
05.04A	01	Volatile Organic Compounds	EPA 502.2
05.04B	01	Unregulated Volatiles	EPA 502.2
05.04C	01	Vinyl Chloride	EPA 502.2
05.04D	01	Trihalomethanes	EPA 502.2
05.04E	01	MTBE, DIPE, TAME, ETBE	EPA 502.2
05.04F	01	Freon 11 & 113	EPA 502.2
05.06	01	EDB and DBCP	EPA 504.1
05.26	02	Haloacetic Acids	SM6251 B
Field of Testing: 06 - Radiochemistry			
06.01	01	Gross Alpha and Beta Radiation	EPA 900.0
06.02	01	Total Alpha Radium	EPA 903.0
06.11	01	Gross Alpha by Coprecipitation	EPA 00-02
Field of Testing: 08 - Aquatic Toxicity Bioassays			
08.03.01		Fathead Minnow (P. promelas)	EPA 600/4-85/013, Static
08.18.01		Fathead Minnow (P promelas)	EPA 600/4-90/027F, Static
Field of Testing: 09 - Physical Properties Testing of Hazardous Waste			
0901	01	Ignitability	EPA 1010
09.02	01	Corrosivity - pH Determination	EPA 9040B
09.02	02	Corrosivity - pH Determination	EPA 9045C
09.03	01	Corrosivity - towards Steel	EPA 1110
09.04	00	Reactivity	Section 7.3 SW-846
Field of Testing: 10 - Inorganic Chemistry and Toxic Chemical Elements of Hazardous Waste			
10.01	04	Antimony	EPA 6010B
10.01	05	Antimony	EPA 6020
10.02	04	Arsenic	EPA 6OIOB
10.02	05	Arsenic	EPA 6020
10.03	03	Barium	EPA 6010B
10.03	04	Barium	EPA 6020
10.04	03	Beryllium	EPA 6010B
10.04	04	Beryllium	EPA 6020
10.05	03	Cadmium	EPA 6010B
10.05	04	Cadmium	EPA 6020
10.06	03	Chromium, Total	EPA 6010B
10.06	04	Chromium, Total	EPA 6020
10.07	03	Cobalt	EPA 6010B
10.07	04	Cobalt	EPA 6020
10.08	03	Copper	EPA 6010B
10.08	04	Copper	EPA 6020
10.09	01	Lead	EPA 7420
10.09	03	Lead	EPA 6010B
10.09	04	Lead	EPA 6020
10.10	01	Mercury	EPA 7470A
10.10	02	Mercury	EPA 7471A
10.11	03	Molybdenum	EPA 6010B

10.11	04	Molybdenum	EPA 6020
10.12	03	Nickel	EPA 6010B
10.12	04	Nickel	EPA 6020
10.13	04	Selenium	EPA 6010B
1013	05	Selenium	EPA 6020
10.14	03	Silver	EPA 6010B
10.14	04	Silver	EPA 6020
10.15	03	Thallium	EPA 6010B
10.15	04	Thallium	EPA 6020
10.16	03	Vanadium	EPA 6010B
10.16	04	Vanadium	EPA 6020
10.17	03	Zinc	EPA 6010B
10.17	04	Zinc	EPA 6020
10.18	02	Chromium (VI)	EPA 7196A
10.19	01	Cyanide	EPA 9012A
10.20	02	Fluoride	EPA 9214
10.21	01	Sulfide	EPA 9034
Field of Testing: 108 - Inorganic Chemistry of Wastewater			
108.120	001	Bromide	EPA 300.0
108.120	002	Chloride	EPA 300.0
108.120	003	Fluoride	EPA 300.0
108.120	004	Nitrate	EPA 300.0
108.120	005	Nitrite	EPA 300.0
108.120	006	Nitrate-nitrite, Total	EPA 300.0
108.120	008	Sulfate	EPA 300.0
Field of Testing: 11 - Extraction Tests of Hazardous Waste			
11.01	01	Waste Extraction Test (WET)	CCR Chapterl 11, Article 5, Appendix
11.03	01	Toxicity Characteristic Leaching Procedure (TCLP)	EPA 1311
Field of Testing: 12 - Organic Chemistry of Hazardous Waste by GC/MS			
12.03A	01	Extractable Organics	EPA 8270C
12.036	01	PCBs	EPA 8270C
12.030	01	Chlorinated Pesticides	EPA 8270C
12.06A	01	Volatile Organic Compounds	EPA 8260B
12.066	01	Oxygenates	EPA 8260B
I2.07A	01	Total Petroleum Hydrocarbons-Gasoline	LUFT
Field of Testing: 13 - Organic Chemistry of Hazardous Waste (excluding GC/MS)			
13.02	01	Nonhalogenated Volatiles	EPA 8015B
13.11	01	Organophosphorus Pesticides	EPA 8141A
13.120	01	Chlorinated Herbicides	EPA 8151A
13.13	01	Polynuclear Aromatic Hydrocarbons	EPA 8310
13.16	01	Total Petroleum Hydrocarbons - Diesel	LUFT
13.17	01	TRPH Screening	EPA 418.1
13.18	01	EDB and DBCP	EPA8O11
13.19A	01	Halogenated Volatiles	EPA 8021B
13.196	01	Aromatic Volatiles	EPA 8021B
13.190	01	BTEX	EPA 8021B
13.240	01	PCBs	EPA 8082
13.250	01	Organochlorine Pesticides	EPA 8081A
Field of Testing: 16 - Wastewater Inorganic Chemistry, Nutrients and Demand			
16.01	01	Acidity	SM231OB (4a)
16.02	01	Alkalinity	SM2320B
16.03	01	Ammonia	SM4500-NH3 B,C
16.03	03	Ammonia	SM4500-NH3 B,E
16.03	04	Ammonia	EPA 350.2
16.03	07	Ammonia	SM4500-NH3 B,H

16.03	08	Ammonia	EPA 350.1
16.04	01	Biochemical Oxygen Demand	SM521OB
16.04	02	Biochemical Oxygen Demand	EPA 405.1
16.07	01	Calcium	SM3111B
16.07	02	Calcium	EPA 215.1
16.07	03	Calcium	SM31 20B
16.07	04	Calcium	EPA 200.7
16.07	05	Calcium	SM3500-Ca D
16.07	06	Calcium	EPA 215.2
16.08	01	Carbonaceous BOD	SM5216B
16.09	01	Chemical Oxygen Demand	SM52200
16.09	02	Chemical Oxygen Demand	EPA 410.1
16.09	03	Chemical Oxygen Demand	EPA 410.2
16.09	04	Chemical Oxygen Demand	EPA 410.3
16.09	05	Chemical Oxygen Demand	EPA 410.4
16.09	06	Chemical Oxygen Demand	SM5220D
16.11	01	Chlorine Residual, Total	SM4500-Cl D
16.11	10	Chlorine Residual, Total	EPA 330.5
16.12	01	Cyanide	SM4500-CN C,D
16.12	02	Cyanide	SM4500-CN C,E
16.12	03	Cyanide	EPA 335.2
16.13	01	Cyanide, amenable	SM4500-CN C,G
16.13	02	Cyanide, amenable	EPA 335.1
16.14	01	Fluoride	SM4500-F B,C
16.14	02	Fluoride	EPA 340.2
16.15	01	Hardness-Total as CaCO3	SM23400
16.15	03	Hardness - Total as CaCO3	EPA 130.2
16.15	04	Hardness -Total as CaCO3	SM312OB
16.15	05	Hardness -Total as CaCO3	EPA 200.7
16.16	01	Kjeldahl Nitrogen	SM4500-NH3 B,C,E
16.16	02	Kjeldahl Nitrogen	EPA 351.3
16.16	08	kjeldahl Nitrogen	EPA 351.2
16.17	01	Magnesium	SM3111B
16.17	02	Magnesium	EPA 242.1
16.17	03	Magnesium	SM31 20B
16.17	04	Magnesium	EPA 200.7
16.18	04	Nitrate	SM4500-NO3 F
16.18	05	Nitrate	EPA 353.2
16.20	01	Oil and Grease	SM5520B
16.20	03	Oil and Grease	EPA 1664
16.21	01	Total Organic Carbon	SM531OB, C, D
16.21	02	Total Organic Carbon	EPA 415.1
16.22	01	Oxygen,dissolved	SM4500-O C
16.22	02	Oxygen,dissolved	EPA 360.2
16.22	03	Oxygen,dissolved	SM4500-O G
16.22	04	Oxygen,dissolved	EPA 360A
16.23	01	pH	SM4500-H+ B
16.23	02	pH	EPA 150.1
16.24	01	Phenols	EPA 420.1
16.25	02	Phosphate, Ortho	SM4500-P E
16.25	03	Phosphate, Ortho	EPA 365.2
16.26	02	Phosphorus, Total	SM4500-P B5, E
16.26	03	Phosphorus, Total	EPA 365.2
16.27	01	Potassium	SM3111B
16.27	02	Potassium	EPA 258.1
16.27	03	Potassium	SM31 20B

16.27	04	Potassium	EPA 200.7
16.28	01	Residue, Total	SM2540B
16.28	02	Residue, Total	EPA 160.3
16.29	01	Residue, Filterable	SM2540C
16.29	02	Residue, Filterable	EPA 160.1
16.30	01	Residue, Non-filterable	SM2540D
16.30	02	Residue, Non-filterable	EPA 160.2
16.31	01	Residue, Settleable	SM2540F
16.31	02	Residue, Settleable	EPA 160.5
16.32	01	Residue, Volatile	EPA 160.4
16.33	01	Silica, Dissolved	SM4500-Si D
16.33	02	Silica, Dissolved	EPA 370.1
16.33	03	Silica, Dissolved	SM312OB
16.33	04	Silica, Dissolved	EPA 200.7
16.34	01	Sodium	SM3111B
16.34	02	Sodium	EPA 273.1
16.34	03	Sodium	SM31 20B
16.34	04	Sodium	EPA 200.7
16.35	01	Conductivity	SM251 OB
16.35	02	Conductivity	EPA 120.1
16.36	02	Sulfate	SM4500-S04 C,D
16.36	03	Sulfate	EPA 375.3
16.37	01	Sulfide	SM4500-S= E
16.37	02	Sulfide	EPA 376.1
16.37	03	Sulfide	SM4500-S= D
16.37	04	Sulfide	EPA 376.2
16.39	01	Surfactants	SM5540C
16.39	02	Surfactants	EPA 425.1
16.41	01	Turbidity	SM21 30B
16.41	02	Turbidity	EPA 180.1
16.44	01	Total Recoverable Petroleum Hydrocarbons	EPA 41 8.1
16.45	01	Total Organic Halides	SM5320B
Field of Testing: 17 - Toxic Chemical Elements in Wastewater			
17.01	05	Aluminum	EPA 200.7
17.02	05	Antimony	EPA 200.7
17.03	07	Arsenic	EPA 200.7
17.03	10	Arsenic	EPA 200.8
17.04	06	Barium	EPA 200.7
17.04	07	Barium	EPA 200.8
17.05	06	Beryllium	EPA 200.7
17.05	08	Beryllium	EPA 200.8
17.06	07	Cadmium	EPA 200.7
17.06	09	Cadmium	EPA 200.8
17.07	03	Chromium (VI)	SM3500-Cr D
17.08	08	Chromium, Total	EPA 200.7
17 08	10	Chromium, Total	EPA 200.8
17.09	07	Cobalt	EPA 200.7
17.09	08	Cobalt	EPA 200.8
1710	07	Copper	EPA 200.7
1710	09	Copper	EPA 200.8
1711	01	Gold	SM3111B
1711	02	Gold	EPA 231.1
17.13	01	Iron	SM3111B
17.13	07	Iron	EPA 200.7
17.14	01	Lead	SM3111B
17.14	07	Lead	EPA 200.7

17.14	09	Lead	EPA 200.8
17.15	06	Manganese	EPA 200.7
1715	08	Manganese	EPA 200.8
17.16	02	Mercury	EPA 245.1
17.16	05	Mercury	EPA 200.8
1717	06	Molybdenum	EPA 200.7
17 17	07	Molybdenum	EPA 200.8
17.18	07	Nickel	EPA 200.7
17.18	09	Nickel	EPA 200.8
17.24	04	Selenium	EPA 200.7
17.24	06	Selenium	EPA 200.8
17.25	07	Silver	EPA 200.7
1725	08	Silver	EPA 200.8
17.27	05	Thallium	EPA 200.7
17.27	06	Thallium	EPA 200.8
17.28	05	Tin	EPA 200.7
17.30	05	Vanadium	EPA 200.7
17.30	06	Vanadium	EPA 200.8
17.31	06	Zinc	EPA 200.7
17.31	08	Zinc	EPA 200.8

Field of Testing: 18 - Organic Chemistry of Wastewater by

18.01	01	All Volatile Organics	EPA 624
18.02	01	All Acid/base/neutral Compounds	EPA 625
18.020	01	Polynuclear Aromatic Hydrocarbons	EPA 625
18.02D	01	Adipates	EPA 625
18.02E	01	Phthalates	EPA 625
18.02F	01	Herbicides	EPA 625
18.02G	01	Other Extractables	EPA 625

Field of Testing: 19 - Organic Chemistry of Wastewater (excluding GC/MS)

19.01	01	Halogenated Volatiles	EPA 601
19.02	01	Aromatic Volatiles	EPA6O2
19.08	01	PCBs and Organochlorine Pesticides	EPA 608
19.08B	01	PCBs	EPA 608
19.10	01	PolynuclearAromatics	EPA 610
19.15	01	Chlorophenoxy Herbicides	SM6640B
19.16	01	Organochlorine Pesticides	EPA 608

As of 04/11/2003, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

APPENDIX D

Transportation Plan

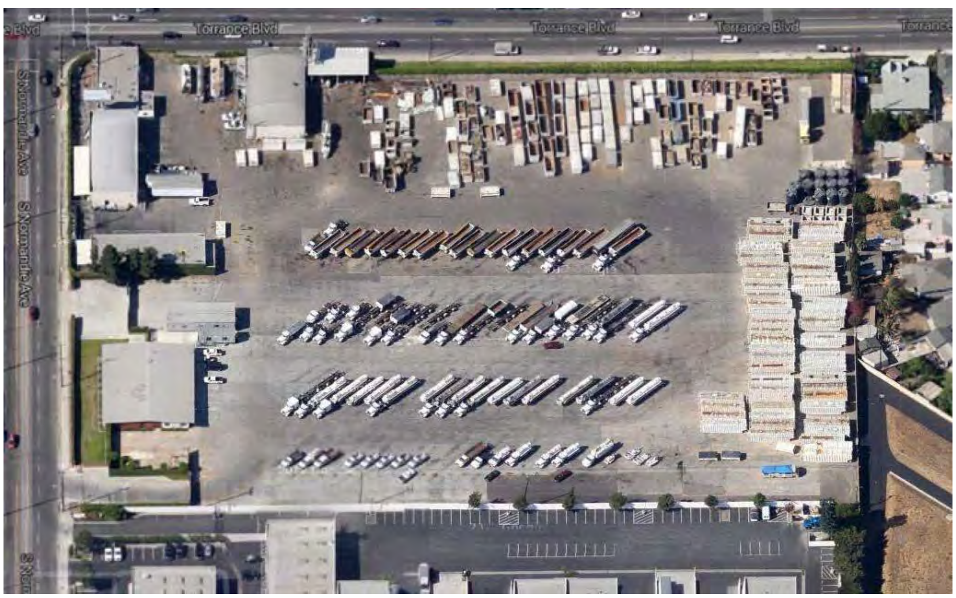
Sharp
Environmental
Technologies, Inc.

839 S. Beacon Street, #1967, San Pedro, California 90733 Tel (310) 505-3675 Fax (310) 548-3935

TRANSPORTATION PLAN

ECOLOGY CONTROL INDUSTRIES

20846 Normandie Avenue
Torrance, California 90502



Prepared for

MR. RON FLURY
ECOLOGY CONTROL INDUSTRIES
20846 Normandie Avenue
Torrance, California 90502

May 6, 2016

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Figures

Appendices

PROFESSIONAL CERTIFICATION

This *Transportation Plan* has been prepared, reviewed and approved by

Jeffrey Sharp, PG #6777, CEG #2160
Senior Geologist

STATEMENT OF LIMITATIONS

The services described in this *Transportation Plan* will be performed in accordance with generally accepted professional environmental consulting principles and practices.

Opinions and recommendations contained in this document apply to conditions existing at certain locations when services will be performed and are intended only for the specific purposes, locations, time frames, and project parameters indicated. Sharp Environmental Technologies, Inc., cannot be responsible for the impact of any changes in environmental standards, practices, or regulations after performance of services.

This document is valid only for this specific project as described herein. It is not to be used for other projects or subsequent phases of this project without the written approval by Sharp Environmental Technologies, Inc.

1. PROJECT SUMMARY

1.1 Administration Information

Site Name:	Ecology Control Industries
Site Location:	20846 Normandie Avenue
Site Contact Name/Phone:	Ron Flury, 320-345-9999
Project Manager:	Jeff Sharp, 310-505-3675
Site Health and Safety Supervisor:	Jim Porter, 562-833-5609

1.2 Emergency Information

Ambulance:	911
Fire:	911
Police:	911
Hospital:	
	LA County Harbor-UCLA Medical Center, 310-222-2345
Health and Safety Manager:	Matt deHaas, 661-917-9024
Project Manager:	Jeff Sharp, 310-505-367

2. INTRODUCTION

The site is located at Ecology Control Industries (ECI), 20846 Normandie Avenue in Torrance, California 90502. The work will be performed at the eastern property boundary within the ECI property identified as the historic storm water drainage channel.

The site consists of a 8.684-acre property currently occupied by ECI as a vehicle and equipment dispatch yard and a temporary hazardous and non-hazardous waste storage facility. The site contains one 5,400-square foot building located along the northern property line and is approximately 90 percent covered with either concrete or paved asphalt, with the remaining area consisting of unpaved soils.

Prior to approximately 1969, the historic storm water pathway in the vicinity of the ECI property was an unlined linear topographic depression that acted as a local surface drainage feature. The drainage channel passed under Torrance Boulevard and traversed the eastern portion of the ECI Property before continuing east through what is now the closed Royal Boulevard Landfill (ARMCO Site).

During the late 1960s and early 1970s, the drainage ditch was replaced by the Los Angeles County Flood Control District (LACFCD) with an underground concrete storm water conveyance system. Project No. 685 (also known as the Kenwood Drain), a concrete box culvert, replaced the historic storm water drainage ditch from 204th Street, along Kenwood Avenue, through the ECI property, and eventually emptying into the Torrance Lateral, a large, open, and concrete-lined drainage channel. The LACFCD maintains an easement for Project 685 within the properties it traverses, including the ECI property.

In 2005, pesticides and polychlorinated biphenyls (PCBs) were detected in soil by ECI as part of due diligence activities prior to sale of the property. The due diligence sampling activities detected several chemicals present in soils at concentrations exceeding residential action levels, including: dichlorodiphenyl-dichloroethane (DDD), dichlordiphenyl-dichloroethylene (DDE), dichlorodiphenyl-trichloroethane (DDT), chlordane, petroleum hydrocarbons, and PCBs. The sum of DDT, DDE, and DDD concentrations (referred to collectively as total DDT) were detected in subsurface soil samples collected from the eastern and southeastern portions of the ECI property in concentrations up to 325 mg/kg. Although contended by Montrose, EPA has attributed the presence of total DDT in these soils to former Montrose chemical manufacturing activities. From 1947 to 1982, Montrose manufactured technical grade DDT at a plant located approximately 0.5 miles north/northwest of the ECI property. EPA believes that DDT-impacted soils at the ECI property may be the result of contaminated storm water runoff from the former Montrose plant. The ECI property is located “downstream” from the former Montrose plant property, by way of the historical storm water drainage pathway.

Based on the data collected during previous investigations, preparation of a removal action work plan was recommended to address the removal of soils impacted with contaminants of concern at the site.

This Transportation Plan has been prepared as an Appendix and supplement to the *Soil Stockpile Removal and Site Restoration Work Plan*. A qualified waste transport and disposal contractor (licensed/registered and insured) will profile, excavate and load soil; transport; and dispose of the soil at an approved off-site facility that is licensed to accept this type of material. At the site the amount of stockpiled soils is calculated to be approximately 7,848 cubic yards of soil. An additional 1,600 cubic yards of soil is expected to be excavated and require characterization and transport for off-site disposal.

All removal, transportation, disposal and site restoration activities will be performed in accordance with all applicable federal, state, and local laws, regulations, and ordinances.

3. WASTE CHARACTERIZATION AND QUANTITY

3.1 Waste Profile

Excavated soils will be profiled for acceptance by the selected disposal facility. Approval from the disposal facility will be obtained before any transportation and disposal activities commence. Additional documentation will be provided to EPA pertaining to waste disposal profiles and waste disposal acceptance prior to any off-site shipments of waste.

Soils excavated from the site will be managed (handled, transported and disposed of as one or more of the following definitions after the waste has been properly profiled and approved for acceptance by the selected disposal facility.

3.1.1 Definitions

Non-Hazardous Waste: Soil or aqueous liquid <u>not</u> characterized as a Resource Conservation and Recovery Act (RCRA) hazardous waste, per 40 CFR Parts 260 - 265, a Toxic Substances Control Act (TSCA) Polychlorinated Biphenyl (PCB) hazardous waste per 40 CFR Part 761, or a California-hazardous waste per 22 CCR Section 66261.

Designated Waste: Non-hazardous waste as defined in California Water Code Section 13173 that consists of, or contains pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives or that could reasonably be expected to affect beneficial uses of the waters of the state as contained in the appropriate state water quality control plan.

Hazardous Waste: Soil or aqueous liquid characterized as a Resource Conservation and Recovery Act (RCRA) hazardous waste, per 40 CFR Parts 260 - 265, a Toxic Substances Control Act (TSCA) Polychlorinated Biphenyl (PCB) hazardous waste, per 40 CFR Part 761, or a non-RCRA, California-hazardous waste per 22 CCR Section 66261.

Non-RCRA (California-Hazardous) Waste: Soil or aqueous liquid characterized as a Non-Resource Conservation and Recovery Act (non-RCRA), California hazardous waste per 22 CCR Section 66261.

When the waste soil is classified as a hazardous waste, compliance with DTSC requirements of hazardous waste generation, temporary on-site storage, transportation, and disposal is required. ECI will sign all manifests as the hazardous waste generator.

3.2 Contaminated Soil Control

Based on the analytical data of samples collected during previous site investigations, the following contaminants of concern in excess of the health screening levels may be encountered during excavation operations

- Total petroleum hydrocarbons as carbons chain (TPHcc)
- Volatile organic compounds (VOCs)
- Polychlorinated biphenyls (PCBs)
- Organochlorine pesticides (OCPs)
- California Code of Regulations, Title 22, metals (17 metals)

It is anticipated that on-site excavated soils may be classified into three waste categories: RCRA hazardous waste (for TCLP values above the regulatory level), non-RCRA California hazardous waste (for TTLC/STLC values above the regulatory level), and non-hazardous waste (for TCLP and TTLC/STLC values below the regulatory levels).

3.3 Waste Quantity

At the site the amount of stockpiled soils is calculated to be approximately 7,848 cubic yards of soil or approximately 10,000 tons. An additional 1,600 cubic yards of soil or approximately 2,400 tons of soil is expected to be excavated and require characterization and transport for off-site disposal. The combined total waste quantity is estimated to be 9,448 cubic yards or 12,400 tons.

3.4 Import Fill Material

Any over-excavated material will be stockpiled pending laboratory analysis for contaminants of concern to determine whether it is acceptable for re-use as backfill material at the site. Additional clean imported fill material will be transported to the site as needed.

4. SOIL LOADING OPERATIONS

Soil will be removed with excavators or other types of earth moving equipment, as necessary to meet the remedial objectives for the site. As soil is excavated, temporary stockpiling will be necessary; the excavated soil will be stored in soil staging areas on-site. The location of the temporary soil storage area will be determined prior to excavation commencement.

4.1 Soil Segregation Operations

Prior to stockpiling/staging, the excavated soil will be segregated to the extent possible to avoid any mixture of hazardous and non-hazardous soils. This segregation will minimize the amount of hazardous soils generated and their associated disposal cost. The soil segregation will be based upon criteria for hazardous and non-hazardous soils and the available sampling data, including analytical results from soil stockpile characterization samples. To the extent feasible, soils containing non-hazardous levels of pesticides will be segregated from soils containing hazardous levels, both during excavation and following soil stockpile characterization. SET will also segregate the stockpiles by field verification using a photo-ionization detector (PID).

RCRA hazardous soils will be transported to a licensed Class 1 landfill. Non-RCRA hazardous soils will be transported to a licensed Class 1 landfill or a facility permitted to receive such wastes and approved by EPA. Non-hazardous soils will be transported to an approved Class 2 or Class 3 landfill.

4.2 Truck Loading Operations

Water spray or mist, as appropriate, will be applied during soil loading operations.

All vehicles will be covered with a tarp and decontaminated prior to leaving the work area. For track-out prevention and control, all trucks will be dry brushed after loading to remove loose soil. Due to large, open asphalt parking lots it is not anticipated that tread plates will be used. If deemed necessary, tread plates will be placed at the exit of the site. The dump truck or roll-off bin portion of the truck will then be covered with a tarp to prevent soil and/or dust from spilling out of the truck during transport to the disposal facility. Additionally, a street sweeper may be operating on the adjacent streets during the hours in which trucks are leaving the site as necessary and required by the DTSC.

Prior to leaving the load-out area, each truck will be inspected by SET to ensure that the payloads are adequately covered, the trucks are cleaned of spilled soil, and the shipment is properly manifested and covered with tarp. Proper hazardous waste placarding may be required for transportation of hazardous wastes.

4.3 Working Hours and Duration

In most cases, excavation, truck loading and unloading will be conducted between 7:00 AM and 6:00 PM Monday through Friday. Working hours may be amended based on permit requirements.

5. TRANSPORTATION CONTROL

5.1 Dust Control during Transportation

Soil for off-site disposal will be transported in tarp-covered end-dump trailers/trucks, drums, or roll- off bins to an approved land disposal facility. All waste-hauler vehicles will be decontaminated prior to leaving the work area. Clean fill materials will be transported in tarp-covered trailers/trucks to the site, as necessary.

5.2 Traffic Control

On-site traffic control signs and traffic management will be placed and performed by SET, as necessary. Transport drivers will follow the on-site traffic control plan and/or traffic control personnel and the SET Project Manager's directions during staging, ingress, and egress activities.

Truck Staging Area: Prior to loading or unloading at the site, all trucks will be staged at a designated area on-site, as much as possible to avoid impacts on the local streets. Careful coordination of trucks will be exercised to help avoid staging off-site and long wait times for trucks. Trucks will not be allowed to sit idling more than five minutes to avoid unnecessary exhaust fumes. Truck drivers will be provided a truck route map (selected facilities included in Appendix A) to the disposal facility along with specific route directions at the beginning of the project. Maps and directions will be available on- site for the duration of the project.

Site Access Control: Trucks to be loaded or unloaded at the site will access the designated soil loading/unloading areas or truck staging areas only as indicated by the SET Project Manager.

Waste-hauling vehicles will not be allowed to cross soil removal or staging areas without proper protection in place. An SET flag person will be located at the gate to assist the truck drivers to safely enter and depart the site.

On-site Traffic Flow: Traffic will be coordinated in such a manner that, at any given time, a limited number of transportation trucks will be on-site to reduce truck traffic on surrounding surface streets and reduce dust generation during on-site transportation.

Speed Limit: While on the site, all vehicles are required to maintain slow speeds, e.g., less than five miles per hour (5 mph), for safety purposes and for dust control measures. While on streets or freeways, all transporters will follow the speed limit requirements and defensive driving techniques (over traffic or road conditions) for traffic safety.

Rush Hours: Transportation trucks will be timed to avoid rush traffic hours.

5.3 Transportation Routes

There are numerous alternate routes that can be selected to the designated land disposal facilities. Selected proposed routes of transportation maps for off-site shipment of impacted soil are included in the Appendix A of this Transportation Plan and will be updated as necessary.

The SET Project Manager will instruct all drivers of the specific haul routes and alternate routes prior to commencing transport activities at the site. The transport route will be strictly adhered to with no exceptions. Should the route be closed due to inclement weather or other emergency road conditions, the transport driver will contact the SET Project Manager with the information, and the Project Manager will provide an alternate route until the original route is available.

The transportation route consists of primary surface streets, highways and improved roads that allow access to end-dump trucks and trailers. The general site ingress and egress route will be located on Normandie Avenue. Selected transportation routes are described in Appendix A.

Consultation with DTSC/City of Torrance: A "haul route permit" may be required and obtained from the City with a copy of the transportation route map at least three days prior to commencement of the proposed excavation. The City will be consulted for any additional traffic control measures.

Mobilization and demobilization of large earthmoving equipment may exceed allowable weight limits and would require additional permits from the State and the City. Heavier loads have higher permit fees and restrictions on time of travel.

Truck Routing

The waste transport and disposal contractor will route trucks to and from the site as described in the "Transportation Route" section of this plan. Trucks will use established public roads that accommodate daily commercial truck traffic. Truck arrivals and departures will be staggered to minimize traffic impacts in the project area. The on-site truck route may be modified based on field conditions.

Local Traffic Control: Transportation of impacted soils or fill materials will be on arterial streets and/or freeways, approved for truck traffic, to minimize any potential impact on the local neighborhood. Moving along the proposed transportation route, all street intersections (except those marked on the transportation route map) are controlled by traffic lights or stop signs. For those intersections without traffic control signs, an SET flag person may be located to assist or direct traffic flows during heavy traffic hours. Therefore, the number of daily truckloads during implementation of the off-site transport is not expected to cause a disruption in local traffic.

Street Maintenance: A "work notice" will be given to the street maintenance authority with a copy of the transportation route map at least three days prior to initiation of the proposed excavation action. All street surfaces along the transportation route (including the site) will be routinely inspected and, if necessary, maintained or repaired by the contractor, during implementation of the tasks. Contractor is responsible for cleaning streets or work yards from spilled soils and the final cleanup after completion of field activities, such as washing. The number of daily truckloads during implementation of the operations plan is not expected to cause damage to surface streets.

6. OFF-SITE LAND DISPOSAL FACILITIES

Based on the results of waste profile and classification, the excavated soil will be transported under hazardous or non-hazardous waste manifests or proper shipping documents to a proper off-site land disposal facility in California, Nevada or Arizona. Copies of blank manifests are included in Appendix B. Once the landfill has provided written acceptance, copies of waste profile reports used to secure disposal permission from the landfill will be provided to EPA. Compliance with the land disposal restrictions, as necessary, will be documented and provided to EPA once written acceptance from the landfill is obtained.

All hazardous wastes will be properly managed, manifested, and transported by a registered and licensed hazardous waste hauler, as necessary, to a proper waste management facility.

6.1 RCRA Hazardous Waste Facilities (Class I)

All RCRA hazardous wastes will be disposed of in a Class 1 hazardous waste land disposal facility permitted to accept such wastes. The facilities marked below may be selected for this project:

Chemical Waste Management
35251 Old Skyline Road
Kettleman, California 93239
Phone: 559-309-7688

CleanHarbors Westmorland
5295 South Garvey Road
Westmorland, California 92281
Phone: 760-344-9400

CleanHarbors Buttonwillow
2500 West Lokern Road
McKittrick, California 93251
Phone: 661-762-6200

US Ecology Nevada
Highway 95, 11 Miles South of Beatty
Beatty, Nevada 89003
Phone: 800-239-3943

6.2 Non-RCRA Hazardous Waste Facilities (Class I or II)

A non-RCRA hazardous waste is a California-only hazardous waste. When a waste is regulated as non-RCRA hazardous waste, it may be disposed at a California Class 1 or 2 landfill or an out-of-state landfill permitted to accept such wastes. The waste management facilities marked below may be selected for this project:

Chemical Waste Management
35251 Old Skyline Road
Kettleman, California 93239
Phone: 559-386-9711

CleanHarbors Westmorland
5295 South Garvey Road
Westmorland, California 92281
Phone: 760-344-9400

CleanHarbors Buttonwillow
2500 West Lokern Road
McKittrick, California 93251
Phone: 661-762-6200

US Ecology Nevada
Highway 95, 11 Miles South of Beatty
Beatty, Nevada 89003
Phone: 800-239-3943

South Yuma Landfill
19536 S Avenue 1E#1E
Yuma, AZ 85365
Phone 928-341-9300

6.3 Non-Hazardous Waste Facilities (Class III)

Non-hazardous soils will either be used for backfilling at the ECI site or transported to a Class 3 landfill permitted to accept such wastes. The sanitary landfills, marked below, may be selected for this project:

Bradley Municipal Landfill
9081 Tujunga Avenue
Sun Valley, California 91352
Phone: 818-252-3247

The non-hazardous TPH-impacted soil may be transported to the following facility for proper disposal.

Thermal Remediation Solutions
1211 W. Gladstone Street
Azusa, California 91702
Phone: 626-815-0233

TPST Soil Recyclers of California
12328 Hibiscus Road
Adelanto, California 92301
Phone: 760-246-8001

7. SHIPMENT DOCUMENTATION

The excavated soil is managed based on the results of stockpile sample analysis, and proper shipping documents (manifests, bill of lading or invoice) from the selected waste transporter will be used to document and accompany each truck shipment. At a minimum, the shipping document will include the following information:

- Name and address of waste generator
- Name and address of waste transporter
- Name and address of disposal facility
- Description of the waste
- Quantity of waste shipped and waste classification codes

Before the excavated soil is transported off-site, an authorized representative of ECI will sign each waste manifest. SET's Site Manager will maintain one copy of the waste manifest on-site. Copies of the waste manifests, signed by the receiving facilities, will be submitted to ECI and DTSC. While at the disposal facility, the truck will be weighed before the payload is off-loaded. Weight tickets or bills of lading will be provided to SET and ECI after the material has been shipped off-site.

7.1 Manifesting

The waste transport and disposal contractor will provide Uniform Hazardous and Non-Hazardous Waste Manifests for the generator's signature. Each load transported from the project site will be manifested. The waste transport and disposal contractor will pre-print manifests with generator's information for the project representative's signature. The Project Manager is responsible for on-site management of manifests. Each manifest will be signed at the project location and the appropriate copies left on-site. Trucks entering the receiving facility will have manifests signed by landfill personnel and the appropriate copies archived at the facility and the generator's copies forwarded to the contractor with certified weight tickets and invoices.

7.2 Recordkeeping

The contractor will be responsible for maintaining a field logbook during the removal and backfilling activities. The field logbook will serve to document observations, personnel on-site, truck arrival and departure times, and other vital project information.

8. HEALTH AND SAFETY

A site-specific health and safety plan (HSP) has been prepared and included as Appendix B in the workplan. Everyone working at the site will be required to be familiar with the HSP.

9. REQUIREMENTS OF TRANSPORTERS

ECI or other qualified transporters will transport the excavated soil off-site or transport fill materials to the site.

9.1 License and Insurance

ECI or the selected waste transport and disposal contractor and all lower-tier waste transport and disposal contractors will maintain the required insurance and license for the duration of the project and will maintain copies of insurance certificates for the duration of the project. Hazardous wastes must be shipped by a registered hazardous waste hauler. Prior to hiring, the contractor shall verify the status of registration and insurance policy of the selected transporters.

9.2 Contingency Plan

Each transporter is required to have a contingency plan prepared to deal with the following conditions:

a) When there are emergency situations (vehicle breakdown, accident, waste spill, waste leak, fire, explosion, etc.) during transportation of excavated soils from the site to the destined disposal facility or during transportation of fill materials from a source to the site;
b) When the volumes of excavated soil change; or
c) When waste characteristics change.

The contingency plan will be prepared in accordance with the DTSC guidance for preparing transportation plans for site remediation. Once the transporter is selected, a copy of its contingency plan will be attached to this Transportation Plan.

9.3 Transportation and Loading Coordinators

The waste transport and disposal contractor will provide a Program Manager to coordinate and manage all project activities throughout the project. The Program Manager is responsible for scope of work implementation including the transportation and disposal activities, and implementation of all aspects of the HSP.

9.4 Project Schedule

The waste transport and disposal contractor will provide a project and truck schedule prior to implementation of the workplan.

9.5 Drivers

The waste transport and disposal contractor will provide the necessary trucks to the project site each operating day for the duration of the transportation phase to complete the off-site removal of hazardous waste soils. Transportation on the project is anticipated to run daily. Transportation includes one hour loading at the project site and one hour off-loading at the receiving facilities.

9.6 Training

The waste transport and disposal contractor will insure all drivers staffed for this project will have all the necessary DOT training, licenses and permits to complete the transportation phase of the project. Truck drivers will have been road tested and tested for dumping procedures.

9.7 Equipment

The waste transport and disposal contractor will maintain a consistent truck fleet for the duration of the project. This ensures consistent transportation procedures and minimizes training. All trucks will have been inspected by the California Highway Patrol. Every driver will perform and record daily safety inspections. Trucks also will be subject to monthly terminal inspections. Trucks are to be serviced and thoroughly inspected every 30 days.

9.8 DOT Certifications

The waste transport disposal contractor will maintain all DOT certifications and maintain copies of certifications for the duration of the project. The waste transport and disposal contractor will transport waste soils in accordance with all local, County, State, and Federal regulations (49 CFR Parts 100 to 177).

9.9 Placarding

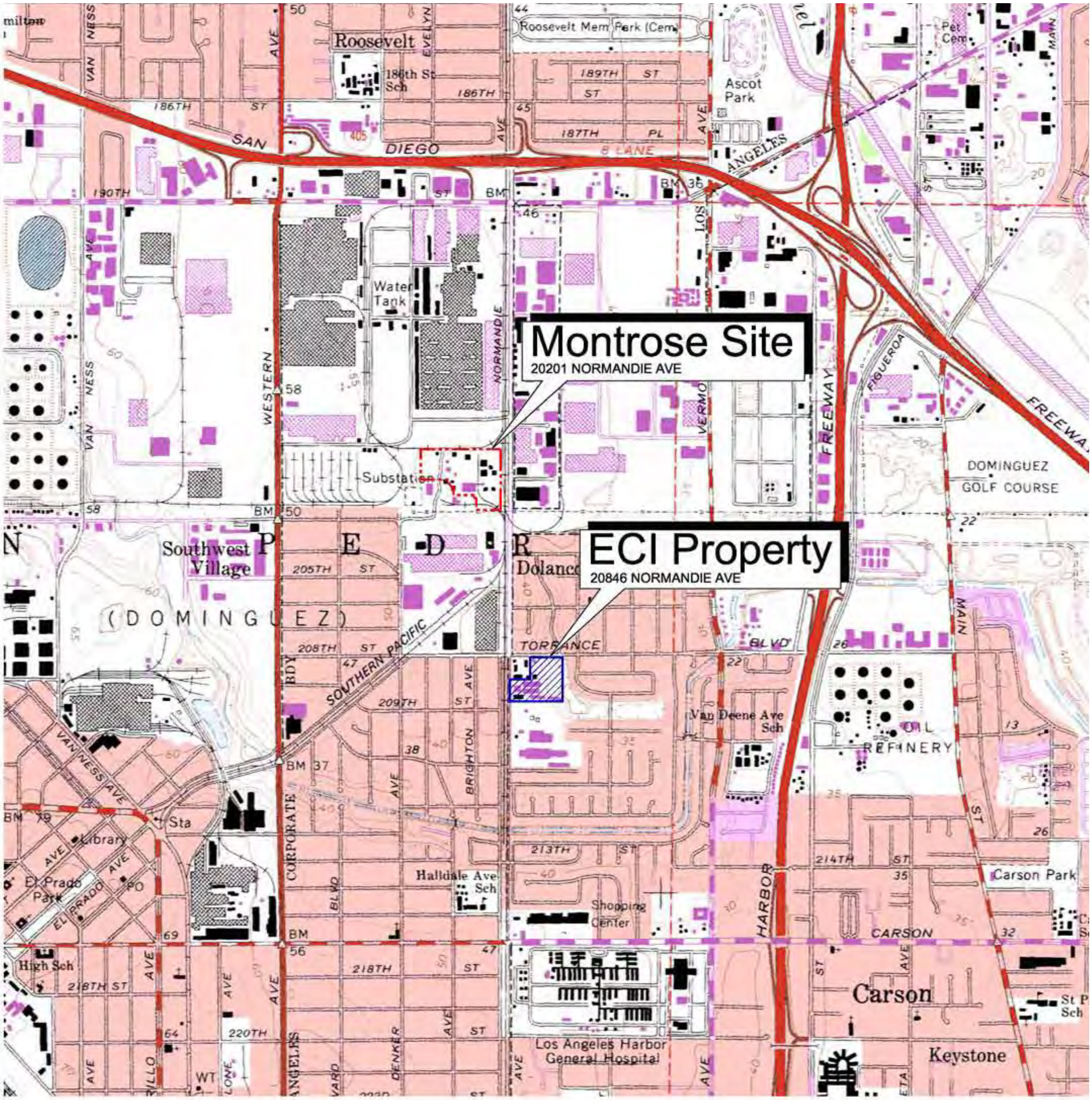
Trucks will have placards displayed according to DOT regulations.

9.10 Communication

Truck drivers will have CB Radios or cellular phones for accessibility during project activities. The transportation coordinator will have direct access to each driver at all times via one or both modes of communication.

FIGURES

Site Vicinity



NORTH

0 1,000 2,000 FEET

SCALE: 1"= 2,000'

Reference:

1. U.S.G.S. Topographic Map, Torrance, California 7.5 Minute Quadrangle. Georeferenced using the State of California's CASIL On-line GIS Database, Copyright 2006.

Source: Soil Investigation Report, Historic Stormwater Pathway, Earth Tech, Inc. 2008

Sharp Environmental Technologies, Inc.

839 S. Beacon Street, #1967, San Pedro, California 90733 Tel (310) 505-3675 Fax (310) 548-3935

Historical Stormwater Pathway - South Montrose Chemical Superfund Site
U.S. EPA Region 9
Los Angeles County, California

FIGURE 1
Site Location

\\engineering\PROJECTS\07163.0000 EPA Region 9\0027 TO 26 RA - Montrose OU6 RA\Graphics\Site Location 1107.ai

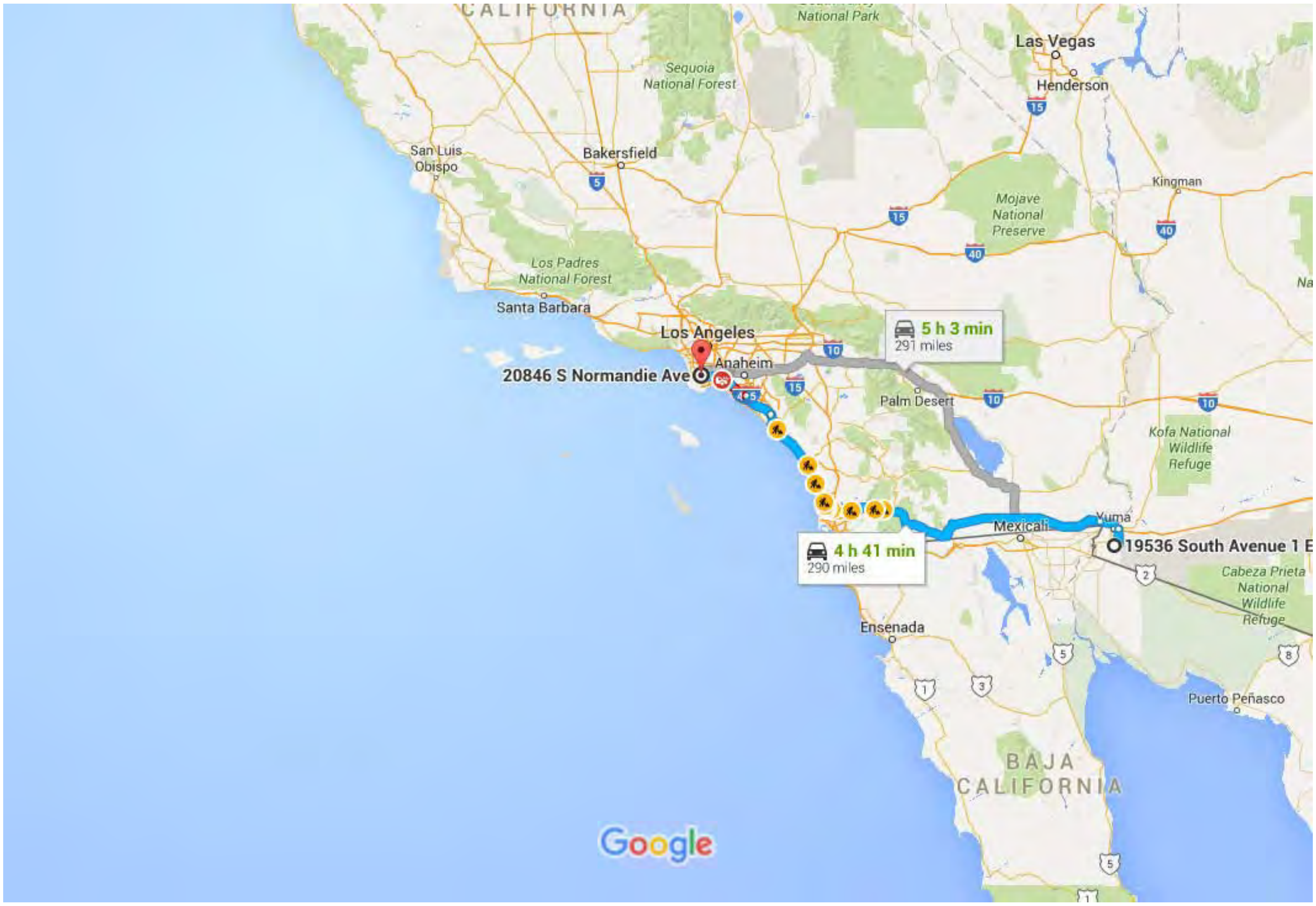
APPENDIX A

Transportation Routes

Google Maps

19536 South Avenue 1 E, Yuma, AZ 85365 to 20846 S Normandie Ave, Torrance, CA 90502

Drive 290 miles, 4 h 41 min



Map data ©2015 Google, INEGI 50 mi

via I-8 W

4 h 41 min

4 h 17 min without traffic

290 miles

This route has tolls.

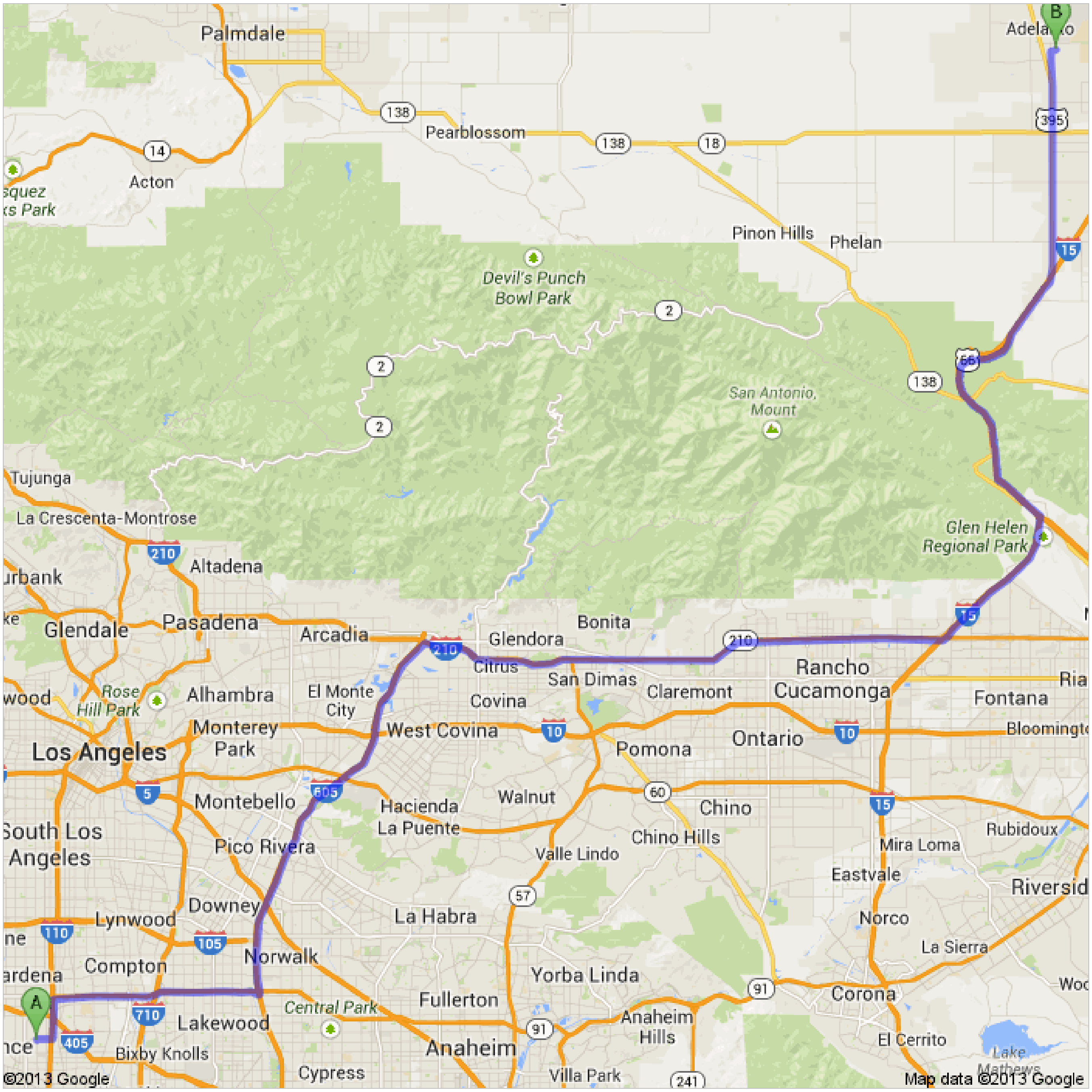
via CA-91 W

5 h 3 min

4 h 30 min without traffic

291 miles

Directions to 12328 Hibiscus Rd, Adelanto, CA 92301
97.9 mi – about **1 hour 37 mins**



A 20846 Normandie Ave, Torrance, CA 90502

1.	Head **north** on **Normandie Ave** toward **Torrance Blvd**	go 322 ft total 322 ft
2.	Take the 1st right onto **Torrance Blvd** About 2 mins	go 0.8 mi total 0.9 mi
3.	Turn left onto **S Figueroa St** About 48 secs	go 0.2 mi total 1.0 mi
4.	Turn left to merge onto **I-110 N** toward **Los Angeles** About 2 mins	go 1.7 mi total 2.7 mi
5.	Take the exit onto **CA-91 E** About 10 mins	go 10.4 mi total 13.2 mi
6.	Take the **Interstate 605 N/Interstate 605 S** exit	go 0.2 mi total 13.4 mi
7.	Keep left at the fork, follow signs for **I-605 N** and merge onto **I-605 N** About 19 mins	go 20.6 mi total 33.9 mi
8.	Take the exit onto **I-210 E/Foothill Fwy** toward **Foothill Fwy/San Bernardino** About 7 mins	go 7.8 mi total 41.7 mi
9.	Continue onto **CA-210/Foothill Fwy** About 17 mins	go 19.0 mi total 60.7 mi
10.	Take the exit toward **Barstow** About 1 min	go 1.4 mi total 62.2 mi
11.	Merge onto **I-15 N** About 20 mins	go 23.2 mi total 85.4 mi
12.	Exit onto **US-395 N** toward **Adelanto/Bishop** About 13 mins	go 10.5 mi total 95.8 mi
13.	Slight right onto **Adelanto Rd** About 3 mins	go 1.7 mi total 97.6 mi
14.	Turn right onto **Hibiscus Rd** About 45 secs	go 0.3 mi total 97.8 mi
15.	Turn left Destination will be on the right	go 344 ft total 97.9 mi

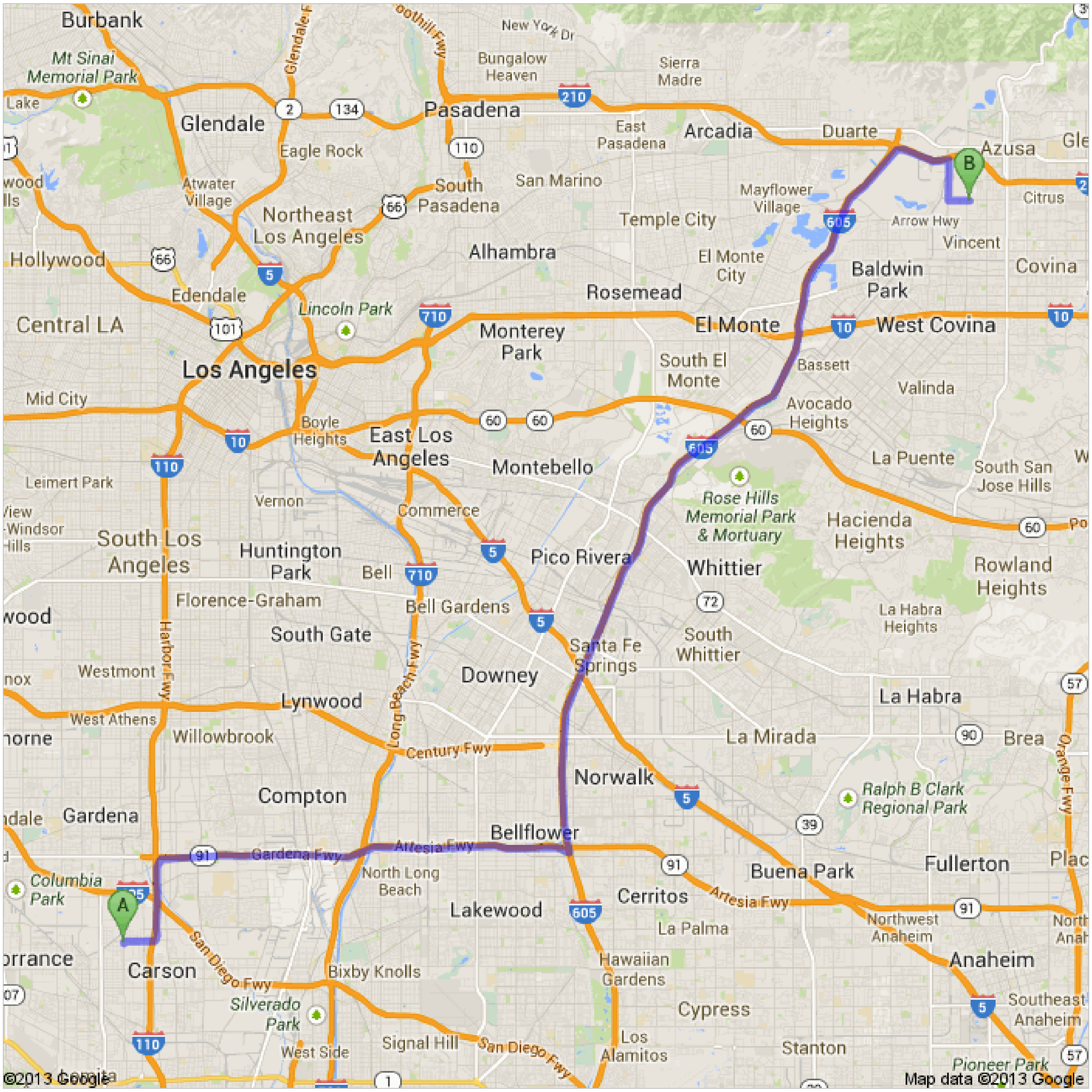
B 12328 Hibiscus Rd, Adelanto, CA 92301

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

Google

Directions to Thermal Remediation Solutions
1211 W Gladstone St, Azusa, CA 91702
37.3 mi – about **41 mins**



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3.	Turn left onto **S Figueroa St** About 48 secs	go 0.2 mi total 1.0 mi
4.	Turn left to merge onto **I-110 N** toward **Los Angeles** About 2 mins	go 1.7 mi total 2.7 mi
5.	Take the exit onto **CA-91 E** About 10 mins	go 10.4 mi total 13.2 mi
6.	Take the **Interstate 605 N/Interstate 605 S** exit	go 0.2 mi total 13.4 mi
7.	Keep left at the fork, follow signs for **I-605 N** and merge onto **I-605 N** About 19 mins	go 20.6 mi total 33.9 mi
8.	Take the exit onto **I-210 E/Foothill Fwy** toward **Foothill Fwy/San Bernardino** About 2 mins	go 1.6 mi total 35.5 mi
9.	Take the **Irwindale Avenue** exit	go 0.2 mi total 35.8 mi
10.	Turn right onto **N Irwindale Ave** About 2 mins	go 1.0 mi total 36.8 mi
11.	Turn left onto **W Gladstone St** Destination will be on the left About 1 min	go 0.5 mi total 37.3 mi

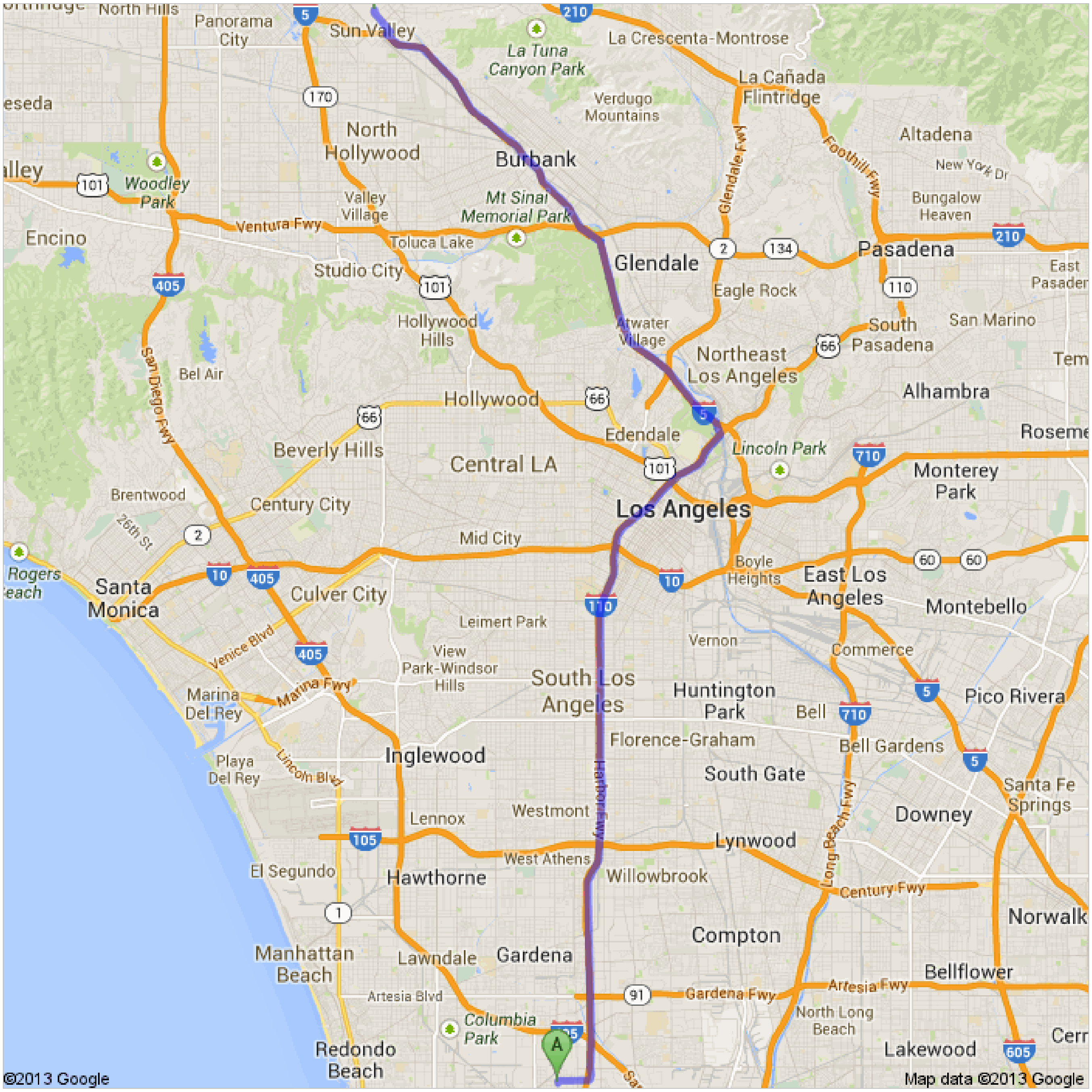
Thermal Remediation Solutions
1211 W Gladstone St, Azusa, CA 91702

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

Google

Directions to 9081 Tujunga Ave, Sun Valley, CA 91352
33.3 mi – about **39 mins**



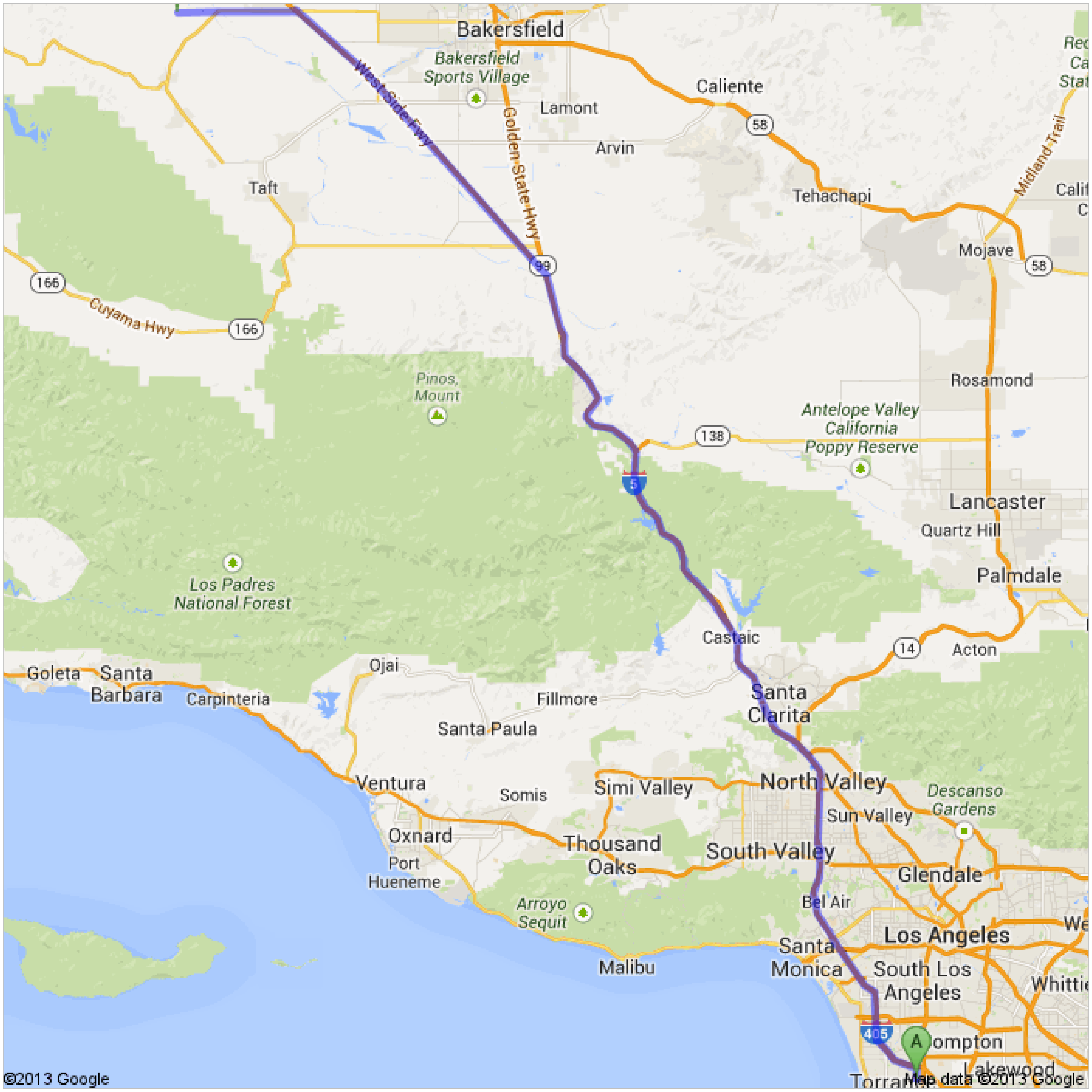
A: 20846 Normandie Ave, Torrance, CA 90502

1.	Head **north** on **Normandie Ave** toward **Torrance Blvd**	go 322 ft total 322 ft
2.	Take the 1st right onto **Torrance Blvd** About 2 mins	go 0.8 mi total 0.9 mi
3.	Turn left onto **S Figueroa St** About 48 secs	go 0.2 mi total 1.0 mi
4.	Turn left to merge onto **I-110 N** toward **Los Angeles** About 14 mins	go 13.9 mi total 14.9 mi
5.	Continue onto **CA-110 N** About 4 mins	go 3.7 mi total 18.6 mi
6.	Take the **Interstate 5 N/Golden State Freeway** exit on the left toward **Sacramento**	go 0.3 mi total 19.0 mi
7.	Keep left at the fork and merge onto **I-5 N** About 13 mins	go 13.3 mi total 32.3 mi
8.	Take the **Penrose St** exit	go 0.2 mi total 32.5 mi
9.	Turn right onto **Penrose St**	go 0.1 mi total 32.6 mi
10.	Take the 1st left onto **Bradley Ave** About 2 mins	go 0.6 mi total 33.3 mi
11.	Continue straight onto **Tujunga Ave** Destination will be on the left	go 384 ft total 33.3 mi

B: 9081 Tujunga Ave, Sun Valley, CA 91352

Google

Directions to Clean Harbors Environmental
2500 W Lokern Rd, McKittrick, CA 93251
148 mi – about **2 hours 20 mins**



20846 Normandie Ave, Torrance, CA 90502

1.	Head **north** on **Normandie Ave** toward **Torrance Blvd** About 3 mins	go 1.4 mi total 1.4 mi
2.	Turn right to merge onto **I-405 N/San Diego Fwy** toward **San Diego Fwy** About 35 mins	go 35.5 mi total 36.9 mi
3.	Merge onto **I-5 N** About 1 hour 27 mins	go 98.6 mi total 135 mi
4.	Take the exit toward **CA-58/Buttonwillow/McKitrick**	go 0.3 mi total 136 mi
5.	Turn right onto **Tracy Ave** About 57 secs	go 0.3 mi total 136 mi
6.	Turn right onto **CA-58 W** About 9 mins	go 8.0 mi total 144 mi
7.	Turn right onto **Lokern Rd** About 5 mins	go 4.1 mi total 148 mi

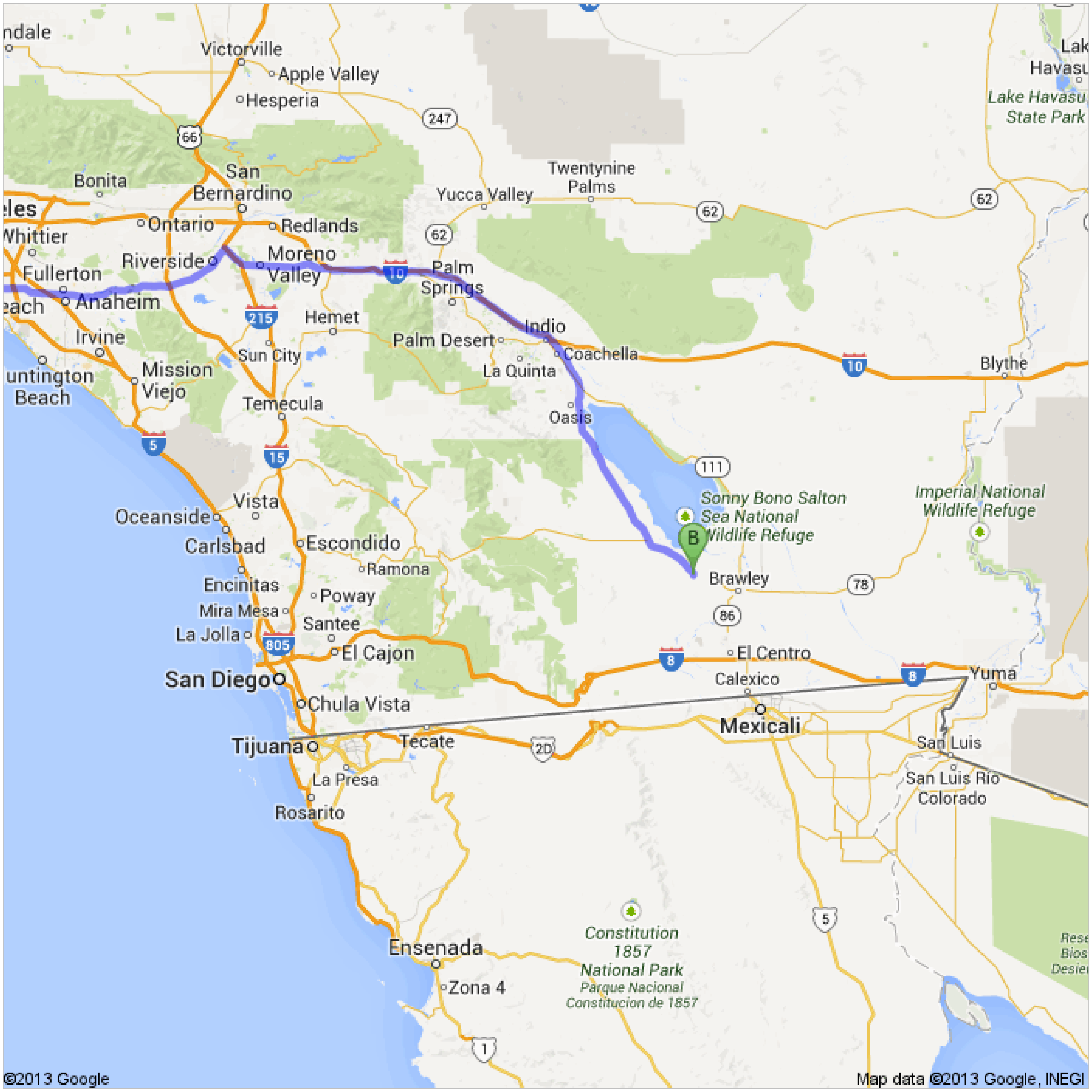
Clean Harbors Environmental
2500 W Lokern Rd, McKittrick, CA 93251

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

Google

Directions to 5295 Garvey Rd, Westmorland, CA 92281
195 mi – about **2 hours 59 mins**



20846 Normandie Ave, Torrance, CA 90502

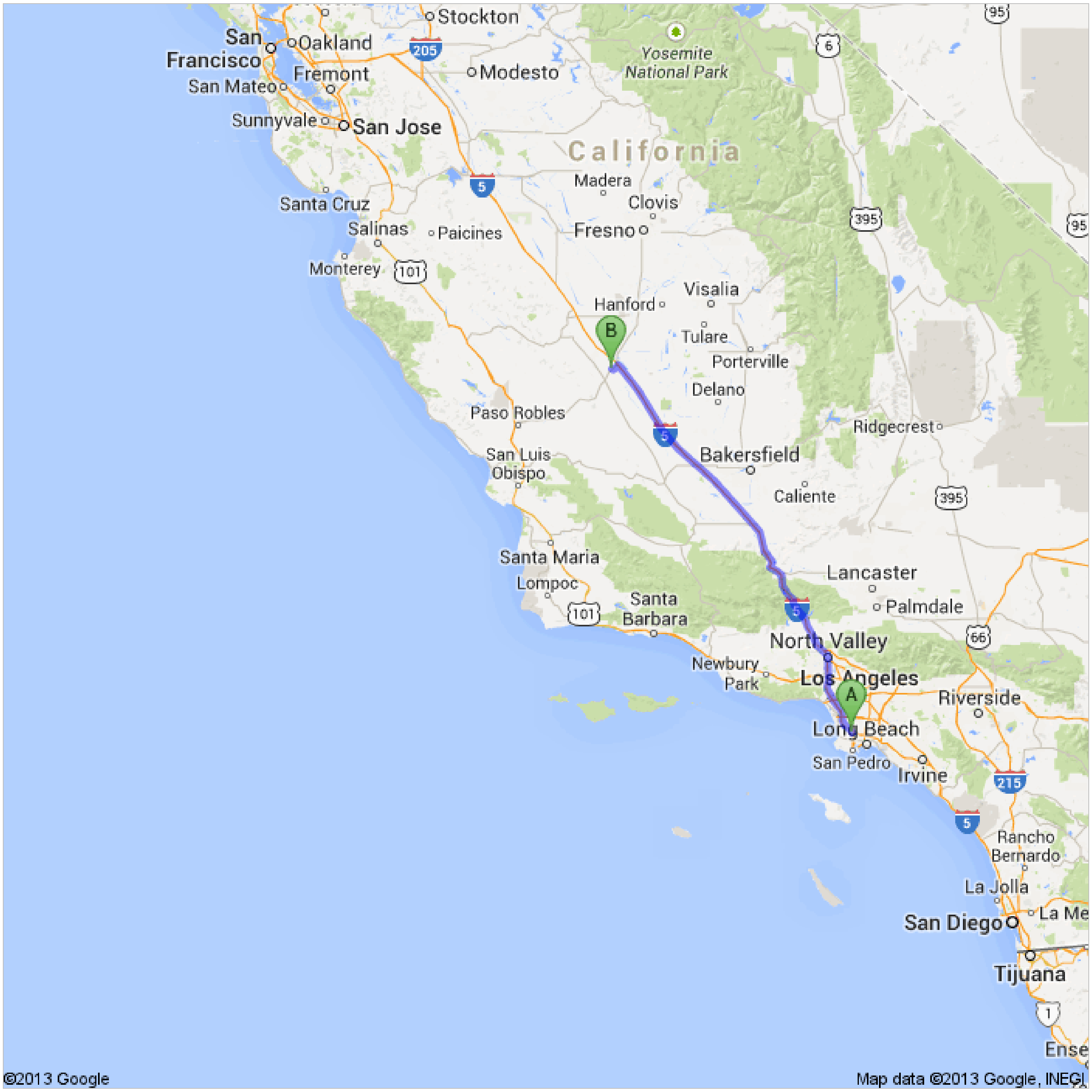
1.	Head **north** on **Normandie Ave** toward **Torrance Blvd**	go 322 ft total 322 ft
2.	Take the 1st right onto **Torrance Blvd** About 2 mins	go 0.8 mi total 0.9 mi
3.	Turn left onto **S Figueroa St** About 48 secs	go 0.2 mi total 1.0 mi
4.	Turn left to merge onto **I-110 N** toward **Los Angeles** About 2 mins	go 1.7 mi total 2.7 mi
5.	Take the exit onto **CA-91 E** About 54 mins	go 58.4 mi total 61.2 mi
6.	Take the **CA-60 E/I-215 S** exit toward **San Diego/Indio**	go 0.5 mi total 61.7 mi
7.	Merge onto **CA-60 E**	go 0.3 mi total 62.1 mi
8.	Merge onto **CA-60 E/I-215 S** About 4 mins	go 4.4 mi total 66.5 mi
9.	Keep left to continue on **CA-60 E** About 17 mins	go 18.2 mi total 84.6 mi
10.	Merge onto **I-10 E** About 41 mins	go 50.6 mi total 135 mi
11.	Keep right to continue on **CA-86 S**, follow signs for **Brawley/El Centro/865 Expy** About 42 mins	go 47.3 mi total 183 mi
12.	Merge onto **CA-78 E/CA-86 S** About 10 mins	go 11.8 mi total 194 mi
13.	Turn right onto **Buck Rd** About 4 mins	go 0.9 mi total 195 mi
14.	Turn right onto **Garvey Rd**	go 217 ft total 195 mi

5295 Garvey Rd, Westmorland, CA 92281

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

Directions to Waste Management Inc
35251 Skyline Rd, Kettleman City, CA 93239
191 mi – about **2 hours 55 mins**



20846 Normandie Ave, Torrance, CA 90502

1.	Head **north** on **Normandie Ave** toward **Torrance Blvd** About 3 mins	go 1.4 mi total 1.4 mi
2.	Turn right to merge onto **I-405 N/San Diego Fwy** toward **San Diego Fwy** About 35 mins	go 35.5 mi total 36.9 mi
3.	Merge onto **I-5 N** About 2 hours 8 mins	go 150 mi total 187 mi
4.	Take the exit toward **CA-41 S**	go 0.4 mi total 187 mi
5.	Keep left at the fork, follow signs for **CA-41 S**	go 174 ft total 187 mi
6.	Turn left onto **CA-41 S** About 5 mins	go 2.8 mi total 190 mi
7.	Turn right onto **Old State Hwy** Destination will be on the left About 2 mins	go 0.7 mi total 191 mi

Waste Management Inc
35251 Skyline Rd, Kettleman City, CA 93239

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

APPENDIX E

Dust, Odor and VOC Air Monitoring Field Data Sheet for Site Activities

Dust, Odor and VOC Air Monitoring Field Data Sheet for Excavation Activities
(Includes Rule 1166 Requirements)
Ecology Control Industries
20846 Normandie Avenue, Torrance, California

Rule 1166 Plan #_______ ID #_______ _______________ **Page of**

Monitor Information		*Calibration Data*		*Excavation Summary for Each Page*	
Brand:		**Gas:**		**Total cu. yd. this page:**	
Model:		**Date:**		**Total cu. yd. to date:**	
Type:		**By:**		**Total cu. yd. removed from site:**	

Time[1]	Location[2]	Activity[3]	PID reading[4]	Visual dust & odor observations (Y/N)		Comments

Notes:
1. In compliance with Rule 1166, VOC readings must be collected every 15 minutes during excavation activities.
2. Examples of location descriptions are 1 ft above excavation load, north property boundary, south property boundary, etc.
3. Activity examples are excavation, stockpile of material, working of stockpiles, loading, etc.
4. PID readings must be converted to hexane using the appropriate response factor for the calibration gas used, if hexane is not used.
5. See work plan for details regarding dust control and air monitoring.

I certify that the information contained in the above document is true and correct. I further certify that the above-listed hydrocarbon monitor was operated in a manner consistent with the manufacturer's specifications and the conditions specified within this plan. In addition, I certify that the above readings represent the actual measurements I observed and recorded during the excavation process.

Signature		Date	
Name		Title	
Company			

APPENDIX F

Deed Restrictions

DECLARATION OF RESTRICTIVE COVENANT RUNNING WITH THE LAND – ENVIRONMENTAL RESTRICTION

WHEREAS, Ronald Flury ("Covenantor") is the owner of certain real property (the "Property") in the County of Los Angeles which is legally described below; and

WHEREAS, the Property has hosted historical industrial uses, including chemical manufacturing and storage and hazardous waste management; and

WHEREAS, the California Department of Toxic Substances Control (the "Department"), pursuant to California Civil Code section 1471, has determined that the Covenants are reasonably necessary to protect present or future human health or safety or the environment as a result of the presence on portions of the Property of hazardous materials as defined in California Health and Safety Code ("H&SC") section 25260.

NOW THEREFORE, The Covenantor and the Department, collectively referred to as the "Parties", hereby agree, pursuant to California Civil Code section 1471 and H&SC section 25355.5 that the use of certain portions of the Property be restricted as set forth in this Covenant and that this Covenant shall run with the land. The Parties further intend that the provisions of this Covenant also be for the benefit of, and be enforceable by, the U.S. Environmental Protection Agency ("U.S. EPA"). as a third-party beneficiary.

ARTICLE I.
STATEMENT OF FACTS

1.01. The property subject to these restrictions (the "Property") is more particularly described in Exhibit "A," attached hereto and incorporated herein by this reference. This property is more specifically described as 20846 South Normandie Ave, Torrance in the County of Los Angeles, Assessor's Parcel Number _____.

1.02. Only those portions of the Property adjacent to the eastern boundary of the parcel where no residential land use is anticipated ("Burdened Property") are subject to these restrictions.

1.03. Attached hereto as Exhibit "B" is a true and exact depiction of the Property.

1.04. The Property is currently undergoing a removal action under U.S. EPA supervision.

1.05. Hazardous substances, as defined in H&SC section 25316 and section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended ("CERCLA"), remain on portions of the Property in soil, including but not limited to: organochlorine pesticides (including chlordane, dichlorodiphenyltrichloroethane, and beta-Hexachlorocyclohexane) and heavy metals. These substances are also hazardous materials as defined in H&SC section 25260.

ARTICLE II.
DEFINITIONS

2.01. CERCLA Lead Agency. "CERCLA Lead Agency" means the government entity having the designated lead responsibility to implement response action under the National Contingency Plan ("NCP")

2.02. Department. "Department" means the California Department of Toxic Substances Control and includes its successor agencies, if any.

2.03. Improvements. "Improvements" shall mean all buildings, roads, driveways, regradings, and paved parking or paved areas, constructed or placed upon any portion of the Property.

2.04. Owner. "Owner" means the Covenantor, its successors in interest, and their successors in interest, including heirs and assigns, who at any time hold title to all or any portion of the Burdened Property.

2.05. Occupant. "Occupant" means Owners and any person or entity entitled by ownership, leasehold, or other legal relationship to the right to occupy any portion of the Burdened Property.

2.06. U.S. EPA. "U.S. EPA" means the United States Environmental Protection Agency and includes its successor agencies, if any.

ARTICLE III.
GENERAL PROVISIONS

3.01. Restrictions to Run with the Land. This Covenant sets forth protective provisions, covenants, conditions and restrictions (collectively referred to as "Restrictions") upon and subject to which the Burdened Property shall be improved, held, used, occupied, leased, sold, hypothecated, encumbered, and/or conveyed. The restrictions set forth in Article IV are reasonably necessary to protect present and future human health and safety or the environment as a result of the presence on the land of hazardous materials. Each and all of the Restrictions shall run with the land, and pass with each and every portion of the Burdened Property, even if subdivided, and shall apply to, inure to the benefit of, and bind the respective successors in interest thereof, for the benefit of the Department and all Owners and Occupants, as well as for the benefit of as a third-party beneficiary. Each and all of the Restrictions are imposed upon the Burdened Property alone; other portions of the property shall not be encumbered unless expressly stated as applicable to the entire property. Each and all of the Restrictions ran with the land pursuant to section 1471 of the Civil Code. Each and all of the Restrictions are enforceable by the Department and U.S. EPA; provided, however, that in the event of conflict between the decisions of the Department and the U.S. EPA, the decisions of the U.S. EPA shall control.

3.02. Binding upon Owners/Occupants. Pursuant to H&SC section 2355.5(a)(1)(C), this Covenant binds all owners of the Burdened Property, their heirs, successors, and assignees, and the agents, employees and lessees of the owners, heirs, successors, and assignees. Pursuant to Civil Code section 1471(b), all successive owners of the Burdened Property are expressly bound hereby for the benefit of the Department and U.S. EPA.

3.03. Written Notice of the Presence of Hazardous Substances. Prior to the sale, lease or sublease of the Burdened Property, or any portion thereof, the owner, lessor, or sublessor shall give the buyer, lessee, or sublessee notice that hazardous substances are located on or beneath the Burdened Property, as required by H&SC section 25359.7.

3.04. Incorporation into Deeds and Leases. The Restrictions set forth herein shall be incorporated by reference in each and all deeds, leases, assignments, or other transfers, of all or any portion of the Burdened Property. Further, each Owner or Occupant shall include in any instrument conveying any interest in all or any portion of the Burdened Property, including but not limited to deeds, leases, and mortgages, a notice which is in substantially the following form:

> "A portion of the land described herein contains hazardous substances. Such condition renders the land and the owner, lessee, or other possessor of the land subject to requirements, restrictions and provisions of the applicable deed restrictions and restrictive covenants filed for this parcel of land. This statement is not a declaration that a hazard exists and does not address the liability of any party."

3.05. Conveyance of Burdened Property. The Owner shall provide notice to the Department and U.S. EPA not later than thirty (30) days after any conveyance of any ownership interest in the Burdened Property (excluding mortgages, liens, and other non-possessory encumbrances). The Department and U.S. EPA shall not, by reason of this Covenant, have authority to approve, disapprove, or otherwise affect any proposed conveyance, except as otherwise provided by law, by administrative order, or by a specific provision of this Covenant.

3.06. Third-Party Beneficiary. The U.S. EPA shall be a third-party beneficiary with respect to the covenants of Owner set forth hereof. U.S. EPA shall have the rights to enforce said covenants as if the U.S. EPA were the declarant, and no modification of said covenants shall affect the rights of the U.S. EPA to enforce said covenants unless the same has been approved in writing by the U.S. EPA. The covenants may not be amended, modified, or revoked without the U.S. EPA's written consent.

ARTICLE IV.
RESTRICTIONS

4.01. Restrictions on Development and Use. Covenantor promises to restrict the use of the Burdened Property as follows:

(a) No residential or other non-industrial use shall be permitted on the Burdened Property.

(b) No schools shall be permitted on the Burdened Property.

(c) No day care centers for children or day care centers for senior citizens shall be permitted on the Burdened Property.

(d) No hospitals shall be permitted on the Burdened Property.

(e) Any Owners or Occupants of the Burdened Property or any portion thereof shall provide written notice via registered mail to the Department and U.S. EPA thirty (30) calendar days prior to the commencement of any excavation work at depths of greater than 5 feet below ground surface on the Burdened Property, except when necessary to address an emergency or repair any Improvements. Any contaminated soils at depths greater than 5 feet below ground surface brought to the surface by grading, excavation, trenching, or backfilling shall be managed by the Owner or its agent or the Occupant or its agent in accordance with all applicable provisions of local, state and federal law. If the excavation work resulted from an emergency, the Owner or Occupant shall notify the Department and U.S. EPA by registered mail within ten (10) business days of both the commencement date of such excavation and after the date of completion.

(f) No Owners or Occupants of the Burdened Property or any portion thereof shall drill, bore, otherwise construct, or use a well for the purpose of extracting water for any use, including but not limited to, domestic, potable, or industrial uses, unless expressly permitted in writing by the Department or the U.S. EPA.

4.02. Access. The Department and U.S. EPA, and their representatives, contractors, and subcontractors, shall have reasonable right of entry and access to the Burdened Property for all activities consistent with the purposes of this Covenant as deemed necessary by the Department and U.S. EPA in order to protect the public health or safety, or the environment. Nothing in this instrument shall limit or otherwise affect U.S. EPA's right of entry and access, or U.S. EPA's authority to take response actions under CERCLA, the National Contingency Plan, 40 C.F.R. Part 300 and its successor provisions, and/or other federal law. Right of entry and access shall exist for the purpose of conducting any activity related to maintenance of the Covenant, including, but not limited to, the following activities:

(a) Monitoring site conditions;

(b) Verifying any data or information submitted to U.S. EPA or the Department;

(c) Conducting investigations regarding contamination at or near the Burdened Property;

(d) Obtaining samples;

(e) Assessing the need for, planning, or implementing additional response actions at or near the Burdened Property; and

(f) Determining whether the Burdened Property is being used in a manner that may need to be prohibited or restricted.

ARTICLE V.
ENFORCEMENT

5.01. Enforcement. The Department and/or U.S. EPA shall be entitled to enforce the terms of this instrument by resort to specific performance or legal process. This Covenant shall be enforceable by the Department pursuant to H&SC, Division 20, Chapter 6.5, Article (commencing with section 25180). Failure of the Covenantor, Owner or Occupant to comply with any of the Restrictions specifically applicable to it shall be grounds for the Department and/or U.S. EPA to require that the Covenantor or Owner modify or remove any Improvements constructed or placed upon any portion of the Burdened Property in violation of the Restrictions.

ARTICLE VI.
VARIANCE, TERMINATION, AND TERM

6.01. Variance. Covenantor, or any other aggrieved person, may apply to the Department for a written variance from the provisions of this Covenant. Such application shall be made in accordance with H&SC section 25233. No variance may be granted without review and prior written concurrence by U.S. EPA.

6.02. Termination. Covenantor, or any other aggrieved person, may apply to the Department and U.S. EPA for a termination of the Restrictions or other terms of this Covenant as they apply to all or any portion of the Burdened Property. Such application shall be made in accordance with H&SC section 25234. If the State of California assumes CERCLA Lead Agency responsibility for Site operation and maintenance, no termination may be granted without prior review and prior written concurrence of the termination by U.S. EPA.

6.03. Term. Unless ended in accordance with the Termination paragraph above, by law, or by the Department in the exercise of its discretion, after review and prior written concurrence by U.S. EPA, this Covenant shall continue in effect in perpetuity.

ARTICLE VII.
MISCELLANEOUS

7.01. No Dedication or Taking Intended. Nothing set forth in this Covenant shall be construed to be a gift or dedication, or offer of a gift or dedication, of the Burdened Property, or any portion thereof to the general public or anyone else for any purpose whatsoever. Further, nothing set forth in this Covenant shall be construed to effect a taking under Federal or state law.

7.02. Recordation. Covenantor shall record this Covenant, with all referenced Exhibits, in the County of Los Angeles within ten (10) days of the Covenantor's receipt of a fully executed original.

APPENDIX G

Contingent Removal Action

Contingent Removal Action

The removal action specified in this Work Plan proposes to establish deed restrictions in the eastern roadway and parking, on property owned by the homeowner's association. A Los Angeles County Flood Control District box culvert passes through this portion of the property, and no residential lots are planned for this area. This area coincides with the historical stormwater pathway where pesticides and PCBs occur in soils at varying concentrations and depths. Within the deed restricted area, soils containing COCs in excess of the health risk criteria would be left in place at depths greater than 5 feet bgs. The deed restrictions would serve as long-term institutional controls for the property to prevent unauthorized exposure to the COC-impacted soils. Soils within the upper 5 feet would be restored in accordance with the health risk criteria to support redevelopment of the property and long-term property maintenance activities.

However, if for any reason, ECI elects to not establish deed restrictions within the eastern roadway and parking areas, the following contingent removal action would be implemented to restore the property for unrestricted residential use in all areas. In accordance with the April 28, 2016 EPA comment letter, the following contingent removal action would also be implemented if ECI has not recorded a land use convenant at least one month before the ECI property is to be transferred to a new owner. The rationale for this approach is to allow sufficient time to complete the work scope before transfer of property ownership.

Soil Excavation of Additional Areas

If no deed restrictions are to be established at the site, soils containing COCs in excess of the health risk criteria at any depth will be excavated. Excavation of an additional 11,000 cubic yards of soil from 22 areas would be required to meet the health risk criteria at any depth as follows:

> Excavation of 22 additional areas is required in order to achieve the health risk criteria at any depth as shown in **Figure G-1**, including 5 areas within the residential lots and 17 areas within the eastern roadway and parking. The 5 areas within the residential lots are identical to the scenario described in Section 7.9 (Borings P-01, P-19, P-25, P-26, and P-31) and contain PCBs exceeding the health risk criterion of 0.089 mg/kg at depths between 5 and 20 feet bgs.
>
> The 17 areas within the eastern roadway and parking are located either west of the Flood Control District box culvert or south of the prior excavation extent as shown in Figure 9. COC impacts in excess of the health risk criteria at any depth within these areas are summarized as follows:
>
> - PCBs: Borings P-03, P-09, P-23, P-28, P-32, and P-35.
> - Total DDT: Borings P-03, P-04, P-23, P-24, P-28, P-32, P-34, P-35, P-36, P-41, P-43, P-47, P-48, P-50, P-51, and P-52.

PCBs and total DDT concentrations exceeding the health risk criteria are co-located at 5 of the soil borings (P-03, P-23, P-28, P-32, and P-35), although not necessarily over the same depth intervals. At the above locations, soils containing PCBs and total DDT in excess of their respective health risk criteria occur at specific depth intervals between 0.5 and 24 feet bgs. All other pesticide COCs exceeding their respective residential health risk criteria at any depth (e.g., chlordane, dieldrin, and heptachlor) were previously excavated in 2015. The overburden, containing less than 10 mg/kg total DDT and less than 0.089 mg/kg PCBs, will be segregated during excavation and stockpiled separately for characterization and potential re-use as backfill at the site. Of the 11,000 cubic yards to be excavated, an estimated 4,700 cubic yards contain COCs in excess of the health risk criteria. Sidewall and bottom samples will be collected from all 22 excavation areas to confirm that the health risk criteria have been achieved.

The estimated volumes of soil to be excavated at these 22 areas are summarized as follows:

Within Planned Residential Lots

- PCB-impacted soils = 850 cubic yards
- Unimpacted overburden = 2,150 cubic yards
- Subtotal = 3,000 cubic yards

Within Eastern Roadway and Parking Areas

- PCB-impacted soils = 900 cubic yards
- Total DDT-impacted soils = 2,950 cubic yards
- Unimpacted overburden = 4,150 cubic yards
- Subtotal = 8,000 cubic yards

Backfill and Site Restoration

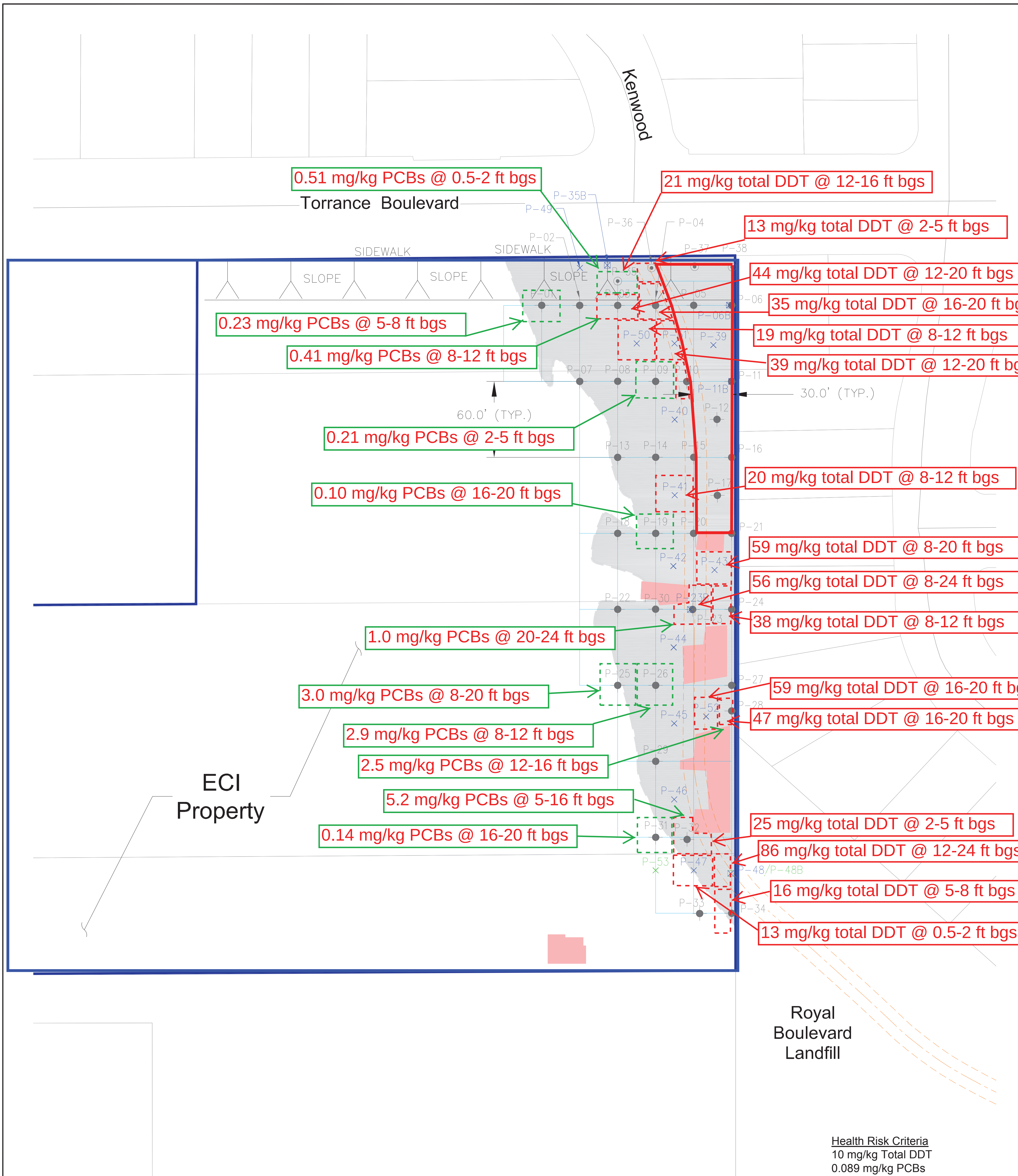
If no deed restrictions are to be established, an estimated 6,300 cubic yards of stockpiled overburden containing less than 10 mg/kg total DDT and less than 0.089 mg/kg PCBs will be backfilled at the site. Prior to backfilling, the overburden soils will be characterized as indicated in Section 7.12 to confirm that COC concentrations are less than the health risk criteria. An additional 8,000 to 8,500 cubic yards of clean fill will be imported and backfilled as needed to restore the site to ground surface. The fill material will be evaluated for the presence of contaminants, including pesticides, as indicated in Section 7.10.1. The soil will be backfilled and compacted in accordance with Los Angeles County permit requirements.

Project Schedule

If no deed restrictions are established under the eastern roadway and parking areas, the estimated schedule to complete all removal action activities is as follows:

1.	Pre-field activities (including Disposal site selection/profiling)	1 week
2.	Soil loading and off-site transportation Stockpiled soil	4-6 weeks
3.	Removal action completion report	7-8 weeks

Some of the above tasks can be conducted concurrently, and therefore, SET estimates that the entire project can be completed, including submittal of the report, in 8 to 14 weeks after EPA approval of this Work Plan is received. All other aspects of the contingent removal action would be conducted in accordance with the procedures established in this Work Plan.



Explanation:

- ECI Property Boundary
- LACFCD Box Drain and Easement
- On-Site ECI Property Soil Boring Location (24' Depth), Drilled July 2006
- On-Site ECI Property Soil Boring Location (16' Depth), Drilled July 2006
- On-Site ECI Property Soil Boring Location (To Delineate Deeper), Drilled June 2007
- On-Site ECI Property Soil Boring Step-Out Location (To Delineate Laterally), Drilled June 2007
- On-Site ECI Property Soil Boring Step-Out Location (To Delineate Deeper), Drilled August 2007
- On-Site ECI Property Soil Boring Step-Out Location (To Delineate Laterally), Drilled August 2007
- 2015 Excavation Area
- Excavation Area (Surveyed Locations, July 2006)
- LACAO Parcel
- EPA Estimated Extent of the Historical Stormwater Pathway
- Proposed DDT excavation area
- Proposed PCB excavation area

NORTH

0 40 80 FEET

SCALE: 1"= 80'

References:

1. Los Angeles County Assessors Office, Los Angeles City Department of Public Works On-line GIS Parcel Database, Copyright 2006.

2. Source of Flood Control / Storm Water Channel: Los Angeles Flood Control District Map, revision date May 6, 1970, Sheet No. 428-RW3.1.

3. CH2M HILL FSP Report dated March 2006 for Excavation Areas.

4. USGS High Resolution Orthoimage, Los Angeles, CA dated March 29, 2004, 0.25 meter resolution Georeferenced from MS Terraserver, Copyright 2006.

5. On-Site ECI Soil Boring Locations Surveyed by Dulin & Boynton Surveyors, conducted July 26, 2006, June 14, 2007 and July 31, 2007.

6. Earth Tech, Draft Soil Investigation Report-Historic Storm Water Pathway, South ECI Industries Property, 20846 South Normandie Ave., Torrance, CA, December 21, 2006.

Source: Soil Investigation Report, Historic Storm Water Pathway, Earth Tech, Inc., 2008

FILE NAME: 91496 MONTROSE ECI FSP.SBLM.1007.DWG (1:1)

Montrose Chemical Corporation — Revised 10/31/07

Additional Excavation Areas
No Deed Restrictions under Eastern Road

Historical Stormwater Pathway

ECI Property

Date: 10-07

Project No. 99700

Sharp Environmental Technologies, Inc.

Figure G-1

SOUTH YUMA COUNTY LANDFILL

__ New Profile __ Renewal

GENERATOR WASTE PROFILE SHEET

19536 S. AVE 1E, YUMA, ARIZONA 85366
Phone: (928) 341-9300, Fax: (928) 341-8454, Webpage: syclandfill.com

WASTE PROFILE #

PLEASE COMPLETE ALL SECTIONS AND FILL IN ALL BLANKS

I. GENERATOR INFORMATION

DATE: 7/12/2016

GENERATOR NAME: Ecology Control Industries, Inc.			
GENERATOR SITE ADDRESS: 20846 Normandie Ave			
CITY: Torrance	COUNTY: Los Angeles	STATE: CA	ZIP: 90502
GENERATOR MAILING ADDRESS: 20846 Normandie Ave			
CITY: Torrance	COUNTY: Los Angeles	STATE: CA	ZIP: 90502
GENERATOR CONTACT NAME: Stephen F Smith			
PHONE NUMBER: (310) 354-9999	FAX NUMBER: (310) 354-6671	Email: ssmith@ecologycontrol.com	

II. TRANSPORTER INFORMATION

TRANSPORTER NAME: Ecology Control Industries	Contact Name: Shon Spence		
TRANSPORTER ADDRESS: 20846 Normandie Ave			
CITY: Torrance	COUNTY: Los Angeles	STATE: CA	ZIP: 90502
TRANSPORTER CONTACT NAME: Shon Spence			
PHONE NUMBER: (310) 354-9999	FAX NUMBER: (310) 354-6671	Email: sspence@ecologycontol.com	

III FINANCIAL RESPONSIBILITY (Billing Information)

NAME OF OWNER, PARTNER(S) OR CORPORATE OFFICER(S)			
NAME: Brent Jones	TITLE: CFO	CELL#: (310)767-3218	E-MAIL bjones@ecologycontrol.com
BILL ADDRESS: 20846 Normandie Ave	ADDRESS #2:	CITY Torrance	ST./ZIP CA 90502

IV. WASTE STREAM INFORMATION

NAME OF WASTE: Non RCRA Hazardous Waste Solid

WASTE DESCRIPTION: Soil with trace DDT

PROCESS GENERATING WASTE: Site clean up of ECI's Torrance yard

PHYSICAL STATE: ☑ SOLID ☐ SEMI-SOLID (Mixture of solid and liquid) ☐ LIQUID (pH= 6-8 , Flash Point = n/a) ☐ OTHER:

METHOD OF SHIPMENT: ☑ BULK ☐ DRUM ☐ BAGGED ☐ TOTES ☐ OTHER:

ESTIMATED ANNUAL QUANTITY: 20,000 ☐ CUBIC YARDS ☑ TONS ☐ GALLONS ☐ OTHER:

FREQUENCY: ☐ ONE TIME ONLY ☐ WEEKLY ☐ MONTHLY ☑ OTHER: Daily shipments till complete

ODOR: None COLOR: Brown SPECIAL HANDLING INSTRUCTIONS: N/A

V. PHYSICAL CHARACTERISTICS OF WASTE

	CHARACTERISTIC COMPONENTS	SOURCE	% BY WEIGHT (RANGE)
1.	Soil	Excavation	99%
2.	Misc. Debris	Site Clean Up	0.9%
3.	DDT	In the excavated soil	0.0001%
4.			

WASTE PROFILE #

VI. BASIS OF DETERMINATION (Check one or both)

☐ Generator knowledge. The generator has applied knowledge of the hazardous characteristics of the waste in light of the materials or the processes used in generating the waste as described in section IV and consistent with 40 CFR 262.11(c)(2). Attach MSDS sheets, as appropriate.

☑ Analytical data. A "representative sample" as defined in 40 CFR 260.10, collected consistent with 40 CFR 261.20(c) or an equivalent method, has been tested consistent with 40 CFR 262.11(c)(1). Attach results and identify which samples are for waste characterization. Note: Industrial liquid wastes require analytical data. EPA 20x rule for using total concentrations applies to solids only. Semi-solid wastes require TCLP testing.

VII. WASTE CHARACTERIZATION

Is there asbestos-containing material in the waste as defined by 40 CFR 61.141? If yes, ☐ Friable ☐ Nonfriable	YES	NO
Is the waste petroleum contaminated soil as defined in ARS 49-851.A.3 (excavated soil containing petroleum compounds)? If yes, is supporting analytical data attached for BTEX compounds (Method 8260) and PAH compounds (Method 8310)? ☐ Yes ☐ No	YES	NO
Is the waste a PCB waste or PCB remediation waste as defined in 40 CFR 761.3?	YES	NO
Does this waste contain radioactive materials (including NORM waste) as defined by ARS 49-701.01(B)(2)?	YES	NO
Is the waste a biohazardous medical waste as defined by AAC R18-13-1401(5)? **Treatment certificate required for treated BMW.**	YES	NO
Is the waste used oil as defined by 40 CFR 279.1, not subject to an exemption listed in 40 CFR 279.10?	YES	NO
Is this waste generated at a Federal Superfund clean-up site?	YES	NO
Is the waste exempt from hazardous waste regulations as from a source listed in 40 CFR 261.4(b)? Examples include waste from households; fossil fuel combustion waste; oil, gas, and geothermal wastes; mining and mineral processing wastes; trivalent chromium wastes; cement kiln dust; arsenically treated wood; petroleum contaminated media & debris from underground storage tank cleanup; and used oil filters. **Identify any hazardous waste exemption:**	YES	NO
Has the waste been generated from a common manufacturing or industrial practice listed in 40 CFR 261.31 (F-list)? Examples include spent solvents, wastes from electroplating and metal finishing, dioxin-bearing wastes, chlorinated aliphatic hydrocarbon wastes, certain wood preserving wastes, and petroleum refinery wastewater treatment sludges.	YES	NO
Has the waste been generated from a specific manufacturing or industrial process listed in 40 CFR 261.32 (K-list)? Examples include certain wastes from wood preservation, manufacturing organic, inorganic, and pesticide chemicals, petroleum refining, manufacturing of certain pigments, explosives, iron, steel, aluminum, and primary aluminum production, ink formulation, and coal coking wastes.	YES	NO
Does the waste contain a pure or commercial grade formulation of an unused chemical product listed in 40 CFR 261.33 (P/U lists)?	YES	NO
Does the waste exhibit a characteristic of ignitability as defined by 40 CFR 261.21 (D001)? Examples include liquids with a flashpoint below 140°F, DOT designated oxidizers, and wastes that can spontaneously catch fire under normal handling conditions.	YES	NO
Does the waste exhibit a characteristic of corrosivity as defined by 40 CFR 261.22 (D002)? Generally, pH < 2 or pH > 12.5.	YES	NO
Does the waste exhibit a characteristic of reactivity as defined by 30 CFR 261.23 (D003)? Examples include wastes that can explode, violently react, or generate hazardous fumes, when exposed to water or under normal handling conditions, generate sulfide or cyanide gas when exposed to pH<2 or >12.5 conditions.	YES	NO
Does the waste exhibit a characteristic of toxicity as defined by 40 CFR 261.24 (D004 – D0043)?	YES	NO

VIII. GENERATOR CERTIFICATION

I hereby certify that to the best of my knowledge and belief, the information contained herein is a true and accurate description of the waste material being offered for disposal. I have made reasonable efforts to ensure that wastes collected from third parties have been appropriately screened and accurately characterized for waste types that are unacceptable at South Yuma County Landfill. I further certify that by utilizing this profile, neither I nor any other employees of the company will deliver for disposal or attempt to deliver for disposal any waste which is classified as hazardous waste, medical or infectious waste, or any other waste material South Yuma County Landfill is not permitted to accept. Our company hereby agrees to fully indemnify South Yuma County Landfill against any damages resulting from this certification being inaccurate or untrue.

Stephen F Smith Vice President

AUTHORIZED REPRESENTATIVE NAME & TITLE (PRINTED)

Ecology Control Industries, Inc.

COMPANY NAME

NOTE: AGENTS OF GENERATOR REQUIRE THIRD-PARTY AUTHORIZATION FROM GENERATOR.

7/13/2016

AUTHORIZED REPRESENTATIVE SIGNATURE DATE

IX. SOUTH YUMA COUNTY LANDFILL DECISION

__REJECTED ___APPROVED RATE ____________ EXPIRATION ____________________

CONDITIONS:

Source of DDT in waste is from historical releases from 1940s through the 1970s.

REVIEWER SIGNATURE DATE

Alpha Scientific Corporation
Environmental Laboratories

01-22-2016

Mr. Jeffrey Sharp
Sharp Environmental Technologies, Inc.
839 S. Beacon Street
San Pedro, CA 90733

Project: Ecology Control Industries
Project Site: 20846 Normandie Ave., Torrance CA 90502
Sample Date: 01-15-2016
Lab Job No.: SE601069

Dear Mr. Sharp:

Enclosed please find the analytical report for the sample(s) received by Alpha Scientific Corporation on 01-15-2016 and analyzed by the following EPA methods:

EPA 8081A (Organochlorine Pesticides)

All analyses have met the QA/QC criteria of this laboratory.

The sample(s) arrived in good conditions (i.e., chilled, intact) and with a chain of custody record attached.

Alpha Scientific Corporation is a CA DHS certified laboratory (Certificate Number 2633). Thank you for giving us the opportunity to serve you. Please feel free to call me at (562) 809-8880 if our laboratory can be of further service to you.

Sincerely,

Roger Wang, Ph. D.
Laboratory Director

Enclosures

This cover letter is an integral part of this analytical report.

Client:	Sharp Environmental Technologies, Inc.	Lab Job No.:	SE601069
Project:	Ecology Control Industries		
Project Site:	20846 Normandie Ave., Torrance CA 90502	Date Sampled:	01-15-2016
Matrix:	Soil	Date Received:	01-15-2016
Extraction Method:	EPA 3550B	Date Extracted:	01-18-2016
Batch No.:	AA19-PS1	Date Analyzed:	01-19-2016
		Date Reported:	01-22-2016

EPA 8081A (Organochlorine Pesticides)
Reporting Unit: μg/kg (ppb)

LAB SAMPLE I.D.			MB	SE601069-1	SE601069-2	SE601069-3	SE601069-4	SE601069-5
CLIENT SAMPLE I.D.				SP1-ECI-1	SP1-ECI-2	SP1-ECI-3	SP2-ECI-1	SP2-ECI-2
DILUTION FACTOR			1	500	10	10	500	500
COMPOUND	**MDL**	**PQL**						
Alpha-BHC	3	5	ND	ND	ND	ND	ND	ND
Gamma-BHC (Lindane)	3	5	ND	ND	ND	ND	ND	ND
Heptachlor	3	5	ND	ND	ND	ND	ND	ND
Aldrin	3	5	ND	ND	ND	ND	ND	ND
Betta-BHC	3	5	ND	ND	ND	ND	ND	ND
Delta-BHC	3	5	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	3	5	ND	ND	ND	ND	ND	ND
Endosulfan I	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDE	3	5	ND	2,440	541	535	3,860	16,300*
Dieldrin	3	5	ND	ND	177	149	ND	ND
Endrin	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDD	3	5	ND	ND	ND	ND	ND	ND
Endosulfan II	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDT	3	5	ND	15,500	503	398	30,500	298,000*
Endrin Aldehyde	3	5	ND	ND	ND	ND	ND	ND
Endosulfan Sulfate	3	5	ND	ND	ND	ND	ND	ND
Methoxychlor	3	5	ND	ND	ND	ND	ND	ND
Chlordane	15	25	ND	ND	450	543	ND	ND
Toxaphene	60	100	ND	ND	ND	ND	ND	ND

MDL=Method Detection Limit;
PQL=Practical Quantitation Limit;
MB=Method Blank;
ND=Not Detected (below DF × MDL);
* Obtained from a higher dilution analysis.
c: Obtained from a lower dilution analysis.

Client: Sharp Environmental Technologies, Inc.
Project: Ecology Control Industries
Project Site: 20846 Normandie Ave., Torrance CA 90502
Matrix: Soil
Extraction Method: EPA 3550B
Batch No.: AA19-PS1

Lab Job No.: SE601069
Date Sampled: 01-15-2016
Date Received: 01-15-2016
Date Extracted: 01-18-2016
Date Analyzed: 01-19-2016
Date Reported: 01-22-2016

EPA 8081A (Organochlorine Pesticides)
Reporting Unit: µg/kg (ppb)

LAB SAMPLE I.D.			MB	SE601069-6	SE601069-7	SE601069-8	SE601069-9	SE601069-10
CLIENT SAMPLE I.D.				SP2-ECI-3	SP2-ECI-4	SP2-ECI-5	SP2-ECI-6	SP2-ECI-7
DILUTION FACTOR			1	500	1000	500	500	500
COMPOUND	**MDL**	**PQL**						
Alpha-BHC	3	5	ND	ND	ND	ND	ND	ND
Gamma-BHC (Lindane)	3	5	ND	ND	ND	ND	ND	ND
Heptachlor	3	5	ND	ND	ND	ND	ND	ND
Aldrin	3	5	ND	ND	ND	ND	ND	ND
Betta-BHC	3	5	ND	ND	ND	ND	ND	ND
Delta-BHC	3	5	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	3	5	ND	ND	ND	ND	ND	ND
Endosulfan I	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDE	3	5	ND	2,570	12,700	9,380	40,100*	52,400*
Dieldrin	3	5	ND	ND	ND	ND	ND	ND
Endrin	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDD	3	5	ND	ND	ND	ND	ND	ND
Endosulfan II	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDT	3	5	ND	20,400	142,000	81,900*	552,000*	589,000*
Endrin Aldehyde	3	5	ND	ND	ND	ND	ND	ND
Endosulfan Sulfate	3	5	ND	ND	ND	ND	ND	ND
Methoxychlor	3	5	ND	ND	ND	ND	ND	ND
Chlordane	15	25	ND	ND	ND	ND	ND	ND
Toxaphene	60	100	ND	ND	ND	ND	ND	ND

MDL=Method Detection Limit;
PQL=Practical Quantitation Limit;
MB=Method Blank;
ND=Not Detected (below DF × MDL);
* Obtained from a higher dilution analysis.
c: Obtained from a conc. dilution analysis.

Client: Sharp Environmental Technologies, Inc.
Project: Ecology Control Industries
Project Site: 20846 Normandie Ave., Torrance CA 90502
Matrix: Soil
Extraction Method: EPA 3550B
Batch No.: AA19-PS1

Lab Job No.: SE601069
Date Sampled: 01-15-2016
Date Received: 01-15-2016
Date Extracted: 01-18-2016
Date Analyzed: 01-19-2016
Date Reported: 01-22-2016

EPA 8081A (Organochlorine Pesticides)
Reporting Unit: μg/kg (ppb)

LAB SAMPLE I.D.			MB	SE601069-11	SE601069-12	SE601069-13	SE601069-14	SE601069-15
CLIENT SAMPLE I.D.				SP2-ECI-8	SP2-ECI-9	SP2-ECI-10	SP2-ECI-DUP	SP3-ECI-1
DILUTION FACTOR			1	1000	500	500	500	10
COMPOUND	**MDL**	**PQL**						
Alpha-BHC	3	5	ND	ND	ND	ND	ND	ND
Gamma-BHC (Lindane)	3	5	ND	ND	ND	ND	ND	ND
Heptachlor	3	5	ND	ND	ND	ND	ND	ND
Aldrin	3	5	ND	ND	ND	ND	ND	ND
Betta-BHC	3	5	ND	ND	ND	ND	ND	ND
Delta-BHC	3	5	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	3	5	ND	ND	ND	ND	ND	ND
Endosulfan I	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDE	3	5	ND	18,300	9,400	7,670	6,620	962
Dieldrin	3	5	ND	ND	ND	ND	ND	ND
Endrin	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDD	3	5	ND	ND	ND	ND	ND	ND
Endosulfan II	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDT	3	5	ND	242,000*	133,000*	98,900*	84,700*	14,400*
Endrin Aldehyde	3	5	ND	ND	ND	ND	ND	ND
Endosulfan Sulfate	3	5	ND	ND	ND	ND	ND	ND
Methoxychlor	3	5	ND	ND	ND	ND	ND	ND
Chlordane	15	25	ND	ND	ND	ND	ND	ND
Toxaphene	60	100	ND	ND	ND	ND	ND	ND

MDL=Method Detection Limit;
PQL=Practical Quantitation Limit;
MB=Method Blank;
ND=Not Detected (below DF × MDL);
* Obtained from a higher dilution analysis
c: Obtained from a conc. dilution analysis..

Client:	Sharp Environmental Technologies, Inc.	Lab Job No.:	SE601069
Project:	Ecology Control Industries		
Project Site:	20846 Normandie Ave., Torrance CA 90502	Date Sampled:	01-15-2016
Matrix:	Soil	Date Received:	01-15-2016
Extraction Method:	EPA 3550B	Date Extracted:	01-18-2016
Batch No.:	AA19-PS1	Date Analyzed:	01-19-2016
		Date Reported:	01-22-2016

EPA 8081A (Organochlorine Pesticides)

Reporting Unit: μg/kg (ppb)

LAB SAMPLE I.D.			MB	SE601069-16	SE601069-17	SE601069-18	SE601069-19	SE601069-20
CLIENT SAMPLE I.D.				SP3-ECI-2	SP3-ECI-3	SP3-ECI-4	SP3-ECI-5	SP3-ECI-6
DILUTION FACTOR			1	500	500	200	500	500
COMPOUND	**MDL**	**PQL**						
Alpha-BHC	3	5	ND	ND	ND	ND	ND	ND
Gamma-BHC (Lindane)	3	5	ND	ND	ND	ND	ND	ND
Heptachlor	3	5	ND	ND	ND	ND	ND	ND
Aldrin	3	5	ND	ND	ND	ND	ND	ND
Betta-BHC	3	5	ND	ND	ND	ND	ND	ND
Delta-BHC	3	5	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	3	5	ND	ND	ND	ND	ND	ND
Endosulfan I	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDE	3	5	ND	1,960	1,340	1,380	3,760	4,810
Dieldrin	3	5	ND	ND	ND	ND	ND	ND
Endrin	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDD	3	5	ND	ND	ND	ND	ND	ND
Endosulfan II	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDT	3	5	ND	18,800	11,000	11,000	38,300	56,800
Endrin Aldehyde	3	5	ND	ND	ND	ND	ND	ND
Endosulfan Sulfate	3	5	ND	ND	ND	ND	ND	ND
Methoxychlor	3	5	ND	ND	ND	ND	ND	ND
Chlordane	15	25	ND	ND	ND	ND	ND	ND
Toxaphene	60	100	ND	ND	ND	ND	ND	ND

MDL=Method Detection Limit;
PQL=Practical Quantitation Limit;
MB=Method Blank;
ND=Not Detected (below DF × MDL);
* Obtained from a higher dilution analysis
c: Obtained from a conc. dilution analysis..

Client: Sharp Environmental Technologies, Inc.
Project: Ecology Control Industries
Project Site: 20846 Normandie Ave., Torrance CA 90502
Matrix: Soil
Extraction Method: EPA 3550B
Batch No.: AA20-PS1

Lab Job No.: SE601069
Date Sampled: 01-15-2016
Date Received: 01-15-2016
Date Extracted: 01-18-2016
Date Analyzed: 01-20-2016
Date Reported: 01-22-2016

EPA 8081A (Organochlorine Pesticides)
Reporting Unit: µg/kg (ppb)

LAB SAMPLE I.D.			MB	SE601069-21	SE601069-22	SE601069-23	SE601069-24	
CLIENT SAMPLE I.D.				SP3-ECI-7	SP3-ECI-8	SP3-ECI-9	SP3-ECI-DUP	
DILUTION FACTOR			1	500	500	500	500	
COMPOUND	**MDL**	**PQL**						
Alpha-BHC	3	5	ND	ND	ND	ND	ND	
Gamma-BHC (Lindane)	3	5	ND	ND	ND	ND	ND	
Heptachlor	3	5	ND	ND	ND	ND	ND	
Aldrin	3	5	ND	ND	ND	ND	ND	
Betta-BHC	3	5	ND	ND	ND	ND	ND	
Delta-BHC	3	5	ND	ND	ND	ND	ND	
Heptachlor Epoxide	3	5	ND	ND	ND	ND	ND	
Endosulfan I	3	5	ND	ND	ND	ND	ND	
4,4'-DDE	3	5	ND	3,730	4,170	3,640	5,440	
Dieldrin	3	5	ND	ND	ND	ND	ND	
Endrin	3	5	ND	ND	ND	ND	ND	
4,4'-DDD	3	5	ND	ND	ND	ND	ND	
Endosulfan II	3	5	ND	ND	ND	ND	ND	
4,4'-DDT	3	5	ND	40,300	32,800	32,800	58,300	
Endrin Aldehyde	3	5	ND	ND	ND	ND	ND	
Endosulfan Sulfate	3	5	ND	ND	ND	ND	ND	
Methoxychlor	3	5	ND	ND	ND	ND	ND	
Chlordane	15	25	ND	ND	ND	ND	ND	
Toxaphene	60	100	ND	ND	ND	ND	ND	

MDL=Method Detection Limit;
PQL=Practical Quantitation Limit;
MB=Method Blank;
ND=Not Detected (below DF × MDL);
* Obtained from a higher dilution analysis

01-22-2016

EPA 8081A (Pesticides)
Batch QA/QC Report

Client:	Sharp Environmental Technologies, Inc.	Lab Job No.:	SE601069
Project:	Ecology Control Industries		
Matrix:	Soil	Lab Sample I.D.:	SS601019-1
Batch No.:	AA19-PS1	Date Analyzed:	01-20-2016

I. MS/MSD Report
Unit: ppb

Analyte	Method Blank	Spike Conc.	MS	MSD	MS %Rec.	MSD %Rec.	% RPD	%RPD Accept. Limit	%Rec Accept. Limit
Gamma-BHC	ND	20	22.5	22.5	112.5	112.5	0.0	30	46-127
Heptachlor	ND	20	23.5	23.3	117.5	116.5	0.9	30	31-134
Aldrin	ND	20	19.9	19.8	99.5	99.0	0.5	30	36-132
Dieldrin	ND	20	19.5	19.4	97.5	97.0	0.5	30	21-134
Endrin	ND	20	18.9	18.7	94.5	93.5	1.1	30	42-139
4,4'-DDT	ND	20	25.0	25.2	125.0	126.0	0.8	30	21-134

II. LCS Result
Unit: ppb

Analyte	LCS Report Value	True Value	Rec.%	Accept. Limit
Gamma-BHC	20.2	20	101.0	80-120
Heptachlor	21.0	20	105.0	80-120
Aldrin	18.8	20	94.0	80-120
Dieldrin	17.9	20	89.5	80-120
Endrin	17.6	20	88.0	80-120
4,4'-DDT	19.3	20	96.5	80-120

ND: Not Detected.

01-22-2016

EPA 8081A (Pesticides)
Batch QA/QC Report

Client:	Sharp Environmental Technologies, Inc.	Lab Job No.:	SE601069
Project:	Ecology Control Industries		
Matrix:	Soil	Lab Sample I.D.:	SS601020-1
Batch No.:	AA20-PS1	Date Analyzed:	01-20-2016

I. MS/MSD Report
Unit: ppb

Analyte	Method Blank	Spike Conc.	MS	MSD	MS %Rec.	MSD %Rec.	% RPD	%RPD Accept. Limit	%Rec Accept. Limit
Gamma-BHC	ND	20	19.7	19.5	98.5	97.5	1.0	30	46-127
Heptachlor	ND	20	23.2	23.4	116.0	117.0	0.9	30	31-134
Aldrin	ND	20	19.5	19.4	97.5	97.0	0.5	30	36-132
Dieldrin	ND	20	18.6	19.4	93.0	97.0	4.2	30	21-134
Endrin	ND	20	16.6	16.8	83.0	84.0	1.2	30	42-139
4,4'-DDT	ND	20	23.1	23.3	115.5	116.5	0.9	30	21-134

II. LCS Result
Unit: ppb

Analyte	LCS Report Value	True Value	Rec.%	Accept. Limit
Gamma-BHC	19.5	20	97.5	80-120
Heptachlor	22.8	20	114.0	80-120
Aldrin	19.9	20	99.5	80-120
Dieldrin	18.1	20	90.5	80-120
Endrin	16.1	20	80.5	80-120
4,4'-DDT	24.0	20	120.0	80-120

ND: Not Detected.

SE601069 1/3

Sharp Environmental Technologies, Inc.

839 S. Beacon Street #1967, San Pedro, California 90733 Tel (310) 505-3675 Fax (310) 548-3935

Chain-of-Custody Record

Analytical Laboratory:	Alpha	Geotracker Global ID:
Project Name:	Ecology Control Industries	NA
Project Address:	20846 Normandie Ave, Torrance, CA 90502	
Project Manager:	Jeff Sharp	
Sampled by:	Matt deHaas	
Phone:	310-505-3675	
Email:	sharpenvironmental@gmail.com	

Number	Sample ID	Lab ID	Type: Grab	Type: Composite	Matrix: Water	Matrix: Soil	Matrix: Vapor	Matrix: Other	Preservative: Cold (4° C)	Preservative: MeOH	Preservative: NaHSO4	Preservative: HCl	Sampling Information: Date	Sampling Information: Time	Method: OCPs EPA Method 8081A	Method: PCBs EPA Method 8082	Method:	Method:	Method: Metals, EPA Method 6010B/7470A	Method: TPH full carbon chain, EPA Method 8015	Method: SVOCs/PAHs, EPA Method 8270C	Method: STLC DDD/DDE/DDT/CH/DI/TP	Method: TCLP DDD/DDE/DDT/CH/DI/TP	Method: Hexavalent Chromium 7196 or 7199	Method: 1,4-Dioxane	Method:	Container: Acetate Sleeve	Container: Encore - 25 grams	Container: VOAs (by EPA 5035)	Container: Plastic Containers - 5 Gallons	Container: Glass jar	Turnaround Time: 24 hour	Turnaround Time: 48 hour	Turnaround Time: Standard
1	SP1-ECI-1	SE601069-1	x			x			x				01/15/16	0900	X	X			X	X	X	X	X	X	X						X			x
2	SP1-ECI-2	-2	↓			↓			↓				↓	0908	↓	↓			↓	↓	↓	↓	↓	↓	↓						X			X
3	SP1-ECI-3	-3	↓			↓			↓				↓	0945	↓	↓			↓	↓	↓	↓	↓	↓	↓						X			X
4	~~SP2-ECI-1~~																																	
5																																		
6																																		
7																																		
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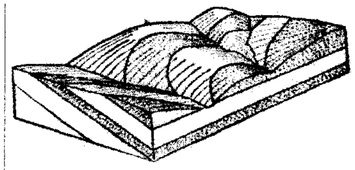
Relinquished by	Date	Time	Received by	Date	Time	Remarks
[signature]	1/15/16	1700	[signature]	01-15-16	17:00	Sample condition (circle): Chilled Intact
						~~Sample from onsite green Baker frac tank collected with hand bailer.~~

SE601069 2/3



Sharp
Environmental
Technologies, Inc.

839 S. Beacon Street #1967, San Pedro, California 90733 Tel (310) 505-3675 Fax (310) 518-3935

Chain-of-Custody Record

Analytical Laboratory:	Alpha	Geotracker Global ID:	
Project Name:	Ecology Control Industries	NA	
Project Address:	20846 Normandie Ave, Torrance, CA 90502		
Project Manager:	Jeff Sharp		
Sampled by:	Matt deHaas		
Phone:	310-505-3675		
Email:	sharpenvironmental@gmail.com		

Number	Sample ID	Lab ID	Type: Grab	Type: Composite	Matrix: Water	Matrix: Soil	Matrix: Vapor	Matrix: Other	Preservative: Cold (4° C)	Preservative: MeOH	Preservative: NaHSO4	Preservative: HCl	Sampling Information: Date	Sampling Information: Time	Method: OCPs EPA Method 8081A	Method: PCBs EPA Method 8082	Method: Metals, EPA Method 6010B/7470A	Method: TPH full carbon chain, EPA Method 8015	Method: SVOCs/PAHs, EPA Method 8270C	Method: STLC DDD/DDE/DDT/CH/DI/TP	Method: TCLP DDD/DDE/DDT/CH/DI/TP	Method: Hexavalent Chromium 7196 or 7199	Method: 1,4-Dioxane	Container: Acetate Sleeve	Container: Encore - 25 grams	Container: VOAs (by EPA 5035)	Container: Plastic Containers - 5 Gallons	Container: Glass jar	Turnaround Time: 24 hour	Turnaround Time: 48 hour	Turnaround Time: Standard
1	SP2-ECI-1	SE601069-4	X			X			X				01/15/16	1245	X	X	X	X	X	X	X	X	X								X
2	SP2-ECI-2	-5											1/15/16	1240																	
3	SP2-ECI-3	-6											1/15/16	1255																	
4	SP2-ECI-4	-7											1/15/16	1155																	
5	SP2-ECI-5	-8											1/15/16	1218																	
6	SP2-ECI-6	-9											1/15/16	1200																	
7	SP2-ECI-7	-10											1/15/16	1204																	
8	SP2-ECI-8	-11											1/15/16	1214																	
9	SP2-ECI-9	-12											1/15/16	1210																	
10	SP2-ECI-10	-13											1/15/16	1222																	
11	SP2-ECI-DUP	-14											1/15/16	—																	
12																															
13																															
14																															
15																															

Relinquished by	Date	Time	Received by	Date	Time	Remarks
MD	1/15/16	1700	[signature]	01-15-16	7:00	Sample condition (circle) Chilled Intact
						~~Sample from onsite green Baker frac tank collected with hand bailer.~~

SE601069-3/3

Sharp
Environmental
Technologies, Inc.

839 S. Beacon Street, #1967, San Pedro, California 90733 Tel (310) 505-3675 Fax (310) 548-3935

Chain-of-Custody Record

Analytical Laboratory:	Alpha	Geotracker Global ID:	
Project Name:	Ecology Control Industries	NA	
Project Address:	20846 Normandie Ave, Torrance, CA 90502		
Project Manager:	Jeff Sharp		
Sampled by:	Matt deHaas		
Phone:	310-505-3675		
Email:	sharpenvironmental@gmail.com		

Number	Sample ID	Lab ID	Type: Grab	Type: Composite	Matrix: Water	Matrix: Soil	Matrix: Vapor	Matrix: Other	Preservative: Cold (4° C)	Preservative: MeOH	Preservative: NaHSO4	Preservative: HCl	Sampling Information: Date	Sampling Information: Time
1	SP3-ECI-1	SE601069-15	x			x			x				01/15/16	1340
2	SP3-ECI-2	-16												1400
3	SP3-ECI-3	-17												1420
4	SP3-ECI-4	-18												1430
5	SP3-ECI-5	-19												1442
6	SP3-ECI-6	-20												1440
7	SP3-ECI-7	-21												1455
8	SP3-ECI-8	-22												1505
9	SP3-ECI-9	-23												1450
10	SP3-ECI-Dup	-24												—
11														
12														
13														
14														
15														

Number	Method: OCPs EPA Method 8081A	Method: PCBs EPA Method 8082			Method: Metals, EPA Method 6010B/7470A	Method: TPH full carbon chain, EPA Method 8015	Method: SVOCs/PAHs, EPA Method 8270C	Method: STLC ~~DDD/DDE/DDT/CH/DI/TP~~	Method: TCLP DDD/DDE/DDT/CH/DI/TP	Method: Hexavalent Chromium 7196 or 7199	Method: 1,4-Dioxane		Container: Acetate Sleeve	Container: Encore - 25 grams	Container: VOAs (by EPA 5035)	Container: Plastic Containers - 5 Gallons	Container: Glass jar	Turnaround Time: 24 hour	Turnaround Time: 48 hour	Turnaround Time: Standard
1	X	X			X	X	X	X	X	X	X						X			x
2																	X			
3																				
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Relinquished by	Date	Time	Received by	Date	Time	Remarks
[signature]	1/15/16	1700	[signature]	01-15-16	17:00	Sample condition (circle) Chilled Intact
						~~Sample from onsite green Baker frac tank collected with hand bailer.~~

Alpha Scientific Corporation
Environmental Laboratories

01-22-2016

Mr. Jeffrey Sharp
Sharp Environmental Technologies, Inc.
839 S. Beacon Street
San Pedro, CA 90733

Project: Ecology Control Industries
Project Site: 20846 Normandie Ave., Torrance, CA 90502
Sample Date: 01-18-2016
Lab Job No.: SE601071

Dear Mr. Sharp:

Enclosed please find the analytical report for the sample(s) received by Alpha Scientific Corporation on 01-18-2016 and analyzed by the following EPA methods:

EPA 8081A (Organochlorine Pesticides)
EPA 8015M (Total Petroleum Hydrocarbons)

All analyses have met the QA/QC criteria of this laboratory.

The sample(s) arrived in good conditions (i.e., chilled, intact) and with a chain of custody record attached.

Alpha Scientific Corporation is a CA DHS certified laboratory (Certificate Number 2633). Thank you for giving us the opportunity to serve you. Please feel free to call me at (562) 809-8880 if our laboratory can be of further service to you.

Sincerely,

Roger Wang, Ph. D.
Laboratory Director

Enclosures

This cover letter is an integral part of this analytical report.

Client:	Sharp Environmental Technologies, Inc.	Lab Job No.:	SE601071
Project:	Ecology Control Industries		
Project Site:	20846 Normandie Ave., Torrance, CA 90502	Date Sampled:	01-18-2016
Matrix:	Soil	Date Received:	01-18-2016
Extraction Method:	EPA 3550B	Date Extracted:	01-18-2016
Batch No.:	AA20-PS1	Date Analyzed:	01-20-2016
		Date Reported:	01-22-2016

EPA 8081A (Organochlorine Pesticides)
Reporting Unit: µg/kg (ppb)

LAB SAMPLE I.D.			MB	SE601071-1	SE601071-2	SE601071-3	SE601071-4	SE601071-5
CLIENT SAMPLE I.D.				SP4-ECI-1	SP4-ECI-2	SP4-ECI-3	SP4-ECI-4	SP4-ECI-5
DILUTION FACTOR			1	500	50	500	500	500
COMPOUND	**MDL**	**PQL**						
Alpha-BHC	3	5	ND	ND	ND	ND	ND	ND
Gamma-BHC (Lindane)	3	5	ND	ND	ND	ND	ND	ND
Heptachlor	3	5	ND	ND	ND	ND	ND	ND
Aldrin	3	5	ND	ND	ND	ND	ND	ND
Betta-BHC	3	5	ND	ND	ND	ND	ND	ND
Delta-BHC	3	5	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	3	5	ND	ND	ND	ND	ND	ND
Endosulfan I	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDE	3	5	ND	2,130	855	3,620	8,900	5,400
Dieldrin	3	5	ND	ND	ND	ND	ND	ND
Endrin	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDD	3	5	ND	ND	ND	ND	ND	ND
Endosulfan II	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDT	3	5	ND	15,300	7,000	31,300	110,000*	46,200
Endrin Aldehyde	3	5	ND	ND	ND	ND	ND	ND
Endosulfan Sulfate	3	5	ND	ND	ND	ND	ND	ND
Methoxychlor	3	5	ND	ND	ND	ND	ND	ND
Chlordane	15	25	ND	ND	ND	ND	ND	ND
Toxaphene	60	100	ND	ND	ND	ND	ND	ND

MDL=Method Detection Limit;
PQL=Practical Quantitation Limit;
MB=Method Blank;
ND=Not Detected (below DF × MDL);
* Obtained from a higher dilution analysis.
c: Obtained from a lower dilution analysis.

Client:	Sharp Environmental Technologies, Inc.	Lab Job No.:	SE601071
Project:	Ecology Control Industries		
Project Site:	20846 Normandie Ave., Torrance, CA 90502	Date Sampled:	01-18-2016
Matrix:	Soil	Date Received:	01-18-2016
Extraction Method:	EPA 3550B	Date Extracted:	01-18-2016
Batch No.:	AA20-PS1	Date Analyzed:	01-20-2016
		Date Reported:	01-22-2016

EPA 8081A (Organochlorine Pesticides)
Reporting Unit: μg/kg (ppb)

LAB SAMPLE I.D.			MB	SE601071-6	SE601071-7	SE601071-8	SE601071-9	SE601071-10
CLIENT SAMPLE I.D.				SP4-ECI-6	SP4-ECI-7	SP4-ECI-8	SP4-ECI-9	SP4-ECI-10
DILUTION FACTOR			1	500	500	500	500	500
COMPOUND	**MDL**	**PQL**						
Alpha-BHC	3	5	ND	ND	ND	ND	ND	ND
Gamma-BHC (Lindane)	3	5	ND	ND	ND	ND	ND	ND
Heptachlor	3	5	ND	ND	ND	ND	ND	ND
Aldrin	3	5	ND	ND	ND	ND	ND	ND
Betta-BHC	3	5	ND	ND	ND	ND	ND	ND
Delta-BHC	3	5	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	3	5	ND	ND	ND	ND	ND	ND
Endosulfan I	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDE	3	5	ND	59,500*	9,700	10,3000	7,090	10,200
Dieldrin	3	5	ND	ND	ND	ND	ND	ND
Endrin	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDD	3	5	ND	ND	ND	ND	ND	ND
Endosulfan II	3	5	ND	ND	ND	ND	ND	ND
4,4'-DDT	3	5	ND	711,000*	109,000*	82,200*	70,900*	122,000*
Endrin Aldehyde	3	5	ND	ND	ND	ND	ND	ND
Endosulfan Sulfate	3	5	ND	ND	ND	ND	ND	ND
Methoxychlor	3	5	ND	ND	ND	ND	ND	ND
Chlordane	15	25	ND	ND	ND	ND	ND	ND
Toxaphene	60	100	ND	ND	ND	ND	ND	ND

MDL=Method Detection Limit;
PQL=Practical Quantitation Limit;
MB=Method Blank;
ND=Not Detected (below DF × MDL);
* Obtained from a higher dilution analysis.
c: Obtained from a conc. dilution analysis.

Client:	Sharp Environmental Technologies, Inc.	Lab Job No.:	SE601071
Project:	Ecology Control Industries		
Project Site:	20846 Normandie Ave., Torrance, CA 90502	Date Sampled:	01-18-2016
Matrix:	Soil	Date Received:	01-18-2016
Extraction Method:	EPA 3550B	Date Extracted:	01-18-2016
Batch No.:	AA20-PS1	Date Analyzed:	01-20-2016

EPA 8081A (Organochlorine Pesticides)
Reporting Unit: μg/kg (ppb)

LAB SAMPLE I.D.			MB	SE601071-11				
CLIENT SAMPLE I.D.				SP2-ECI-DUP				
DILUTION FACTOR			1	500				
COMPOUND	**MDL**	**PQL**						
Alpha-BHC	3	5	ND	ND				
Gamma-BHC (Lindane)	3	5	ND	ND				
Heptachlor	3	5	ND	ND				
Aldrin	3	5	ND	ND				
Betta-BHC	3	5	ND	ND				
Delta-BHC	3	5	ND	ND				
Heptachlor Epoxide	3	5	ND	ND				
Endosulfan I	3	5	ND	ND				
4,4'-DDE	3	5	ND	3,630				
Dieldrin	3	5	ND	ND				
Endrin	3	5	ND	ND				
4,4'-DDD	3	5	ND	ND				
Endosulfan II	3	5	ND	ND				
4,4'-DDT	3	5	ND	32,500				
Endrin Aldehyde	3	5	ND	ND				
Endosulfan Sulfate	3	5	ND	ND				
Methoxychlor	3	5	ND	ND				
Chlordane	15	25	ND	ND				
Toxaphene	60	100	ND	ND				

MDL=Method Detection Limit;
PQL=Practical Quantitation Limit;
MB=Method Blank;
ND=Not Detected (below DF × MDL);
* Obtained from a higher dilution analysis
c: Obtained from a conc. dilution analysis..

Alpha Scientific Corporation
Environmental Laboratories

01-22-2016

EPA 8081A (Pesticides)
Batch QA/QC Report

Client:	Sharp Environmental Technologies, Inc.	Lab Job No.:	SE601071
Project:	Ecology Control Industries		
Matrix:	Soil	Lab Sample I.D.:	SS601020-1
Batch No.:	AA20-PS1	Date Analyzed:	01-20-2016

I. MS/MSD Report
Unit: ppb

Analyte	Method Blank	Spike Conc.	MS	MSD	MS %Rec.	MSD %Rec.	% RPD	%RPD Accept. Limit	%Rec Accept. Limit
Gamma-BHC	ND	20	19.7	19.5	98.5	97.5	1.0	30	46-127
Heptachlor	ND	20	23.2	23.4	116.0	117.0	0.9	30	31-134
Aldrin	ND	20	19.5	19.4	97.5	97.0	0.5	30	36-132
Dieldrin	ND	20	18.6	19.4	93.0	97.0	4.2	30	21-134
Endrin	ND	20	16.6	16.8	83.0	84.0	1.2	30	42-139
4,4'-DDT	ND	20	23.1	23.3	115.5	116.5	0.9	30	21-134

II. LCS Result
Unit: ppb

Analyte	LCS Report Value	True Value	Rec.%	Accept. Limit
Gamma-BHC	19.5	20	97.5	80-120
Heptachlor	22.8	20	114.0	80-120
Aldrin	19.9	20	99.5	80-120
Dieldrin	18.1	20	90.5	80-120
Endrin	16.1	20	80.5	80-120
4,4'-DDT	24.0	20	120.0	80-120

ND: Not Detected.

Sharp
Environmental
Technologies, Inc.

839 S. Beacon Street #1967, San Pedro, California 90733

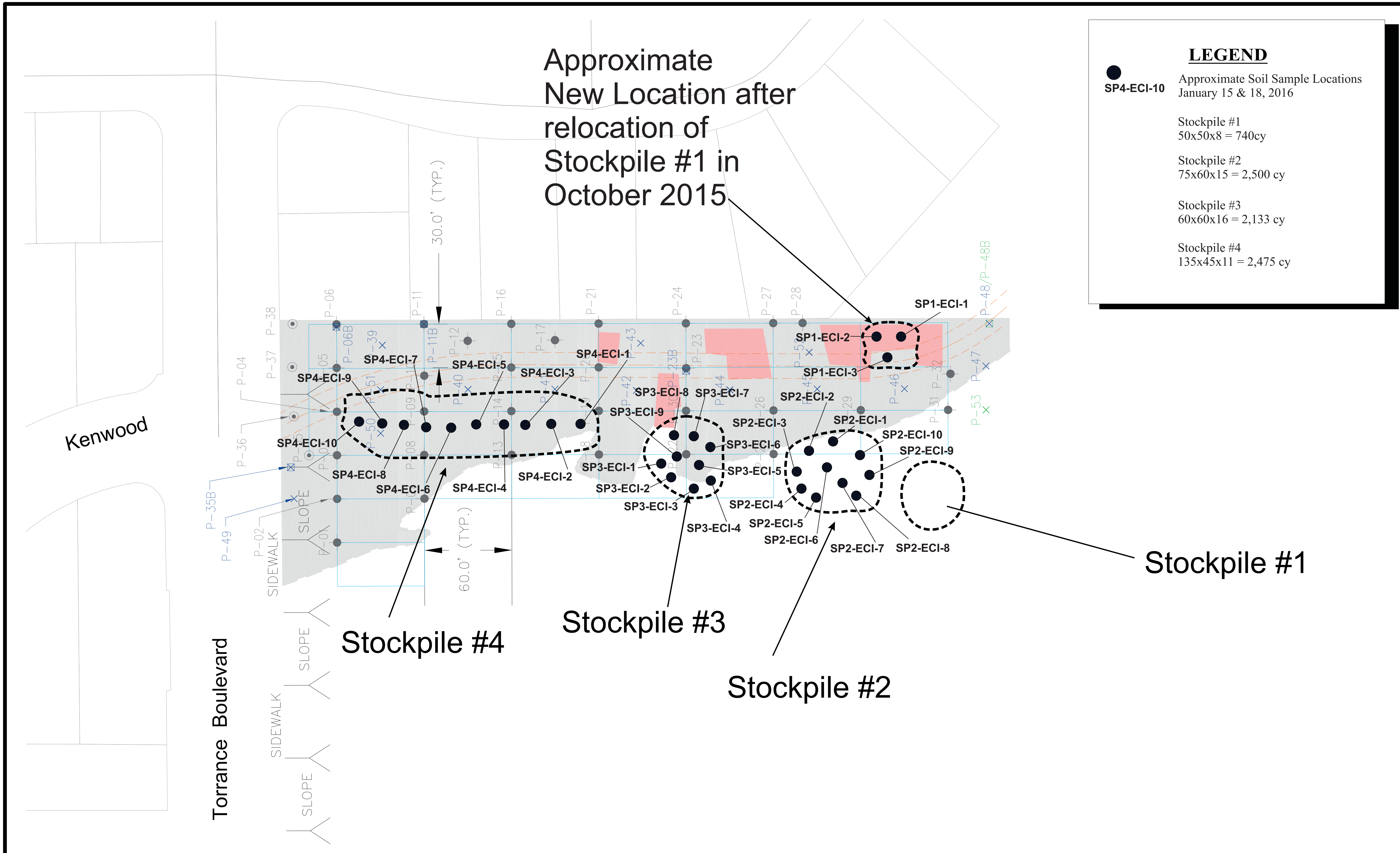
SE601071

Chain-of-Custody Record

Analytical Laboratory:	Alpha	Geotracker Global ID:	
Project Name:	Ecology Control Industries	NA	
Project Address:	20846 Normandie Ave, Torrance, CA 90502		
Project Manager:	Jeff Sharp		
Sampled by:	Matt deHaas		
Phone:	310-505-3675		
Email:	sharpenvironmental@gmail.com		

			Type		Matrix				Preservative				Sampling Information		Method												Container					Turnaround Time		
Number	Sample ID	Lab ID	Grab	Composite	Water	Soil	Vapor	Other	Cold (4° C)	MeOH	NaHSO4	HCl	Date MD	Time	OCPs EPA Method 8081A	PCBs EPA Method 8082			Metals, EPA Method 6010B/7470A	TPH full carbon chain, EPA Method 8015	SVOCs/PAHs, EPA Method 8270C	STLC DDD/DDE/DDT/CH/DI/TP	TCLP DDD/DDE/DDT/CH/DI/TP	Hexavalent Chromium 7196 or 7199	1,4-Dioxane		Acetate Sleeve	Encore - 25 grams	VOAs (by EPA 5035)	Plastic Containers - 5 Gallons	Glass jar	24 hour	48 hour	Standard
1	SP4-ECI-1	SE601071-1	x			x			x				1/18/16 ~~01/15/16~~	0755	X	X			X	X	X	X	X	X	X						X			x
2	SP4-ECI-2	-2												0802																				
3	SP4-ECI-3	-3												0815																				
4	SP4-ECI-4	-4												0830																				
5	SP4-ECI-5	-5												0855																				
6	SP4-ECI-6	-6												0908																				
7	SP4-ECI-7	-7												0845																				
8	SP4-ECI-8	-8												0922																				
9	SP4-ECI-9	-9												0920																				
10	SP4-ECI-10	-10												0930																				
11	SP4-ECI-DUP	-11												—																				
12																																		
13																																		
14																																		
15																																		

Relinquished by	Date	Time	Received by	Date	Time	Remarks
[signature]	1/18/16 ~~10/19/15~~	1055	[signature]	1/18/16	10:55 AM	Sample condition (circle): Chilled Intact
						~~Sample from onsite green Baker frac tank collected with hand bailer.~~



Date: 01/28/16
Drawn by: jes
Revised by: mrd

0 30 60
APPROXIMATE SCALE IN FEET

Reference: Revised Soil Investigation Report Historic Storm Water Pathway-South, Ecology Control Industries Property 20846 South Normandie Ave, Torrance, CA 90502 - Figure 6, Final Soil Boring Location Map, June 20, 2008. Prepared by Earth Tech, Inc. For Montrose Chemical Company of CA in Compliance with USEPA Unilateral Order UAO 09-2006-022 dated June 23, 2006.

SHARP ENVIRONMENTAL TECHNOLOGIES, INC.
839 S BEACON STREET #1967 PEDRO, CA. 90733
(310) 505-3675, Fax (310) 548-3935

Figure 1
Site Plan with Soil Stockpile Sample Locations
Ecology Control Industries
20846 Normandie Avenue
Torrance, California